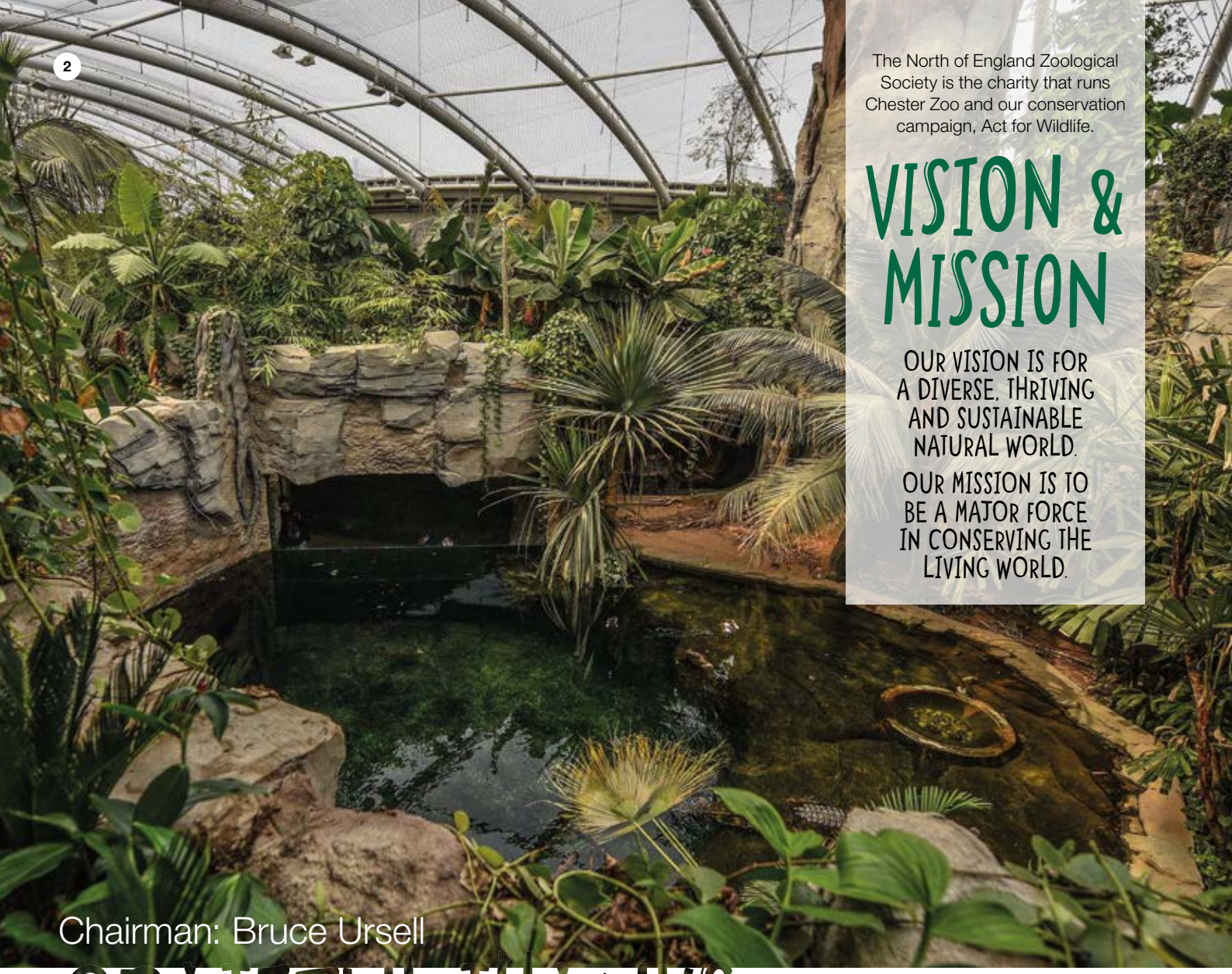
CHESTER ZOO

2016 ZOO REVIEW

Annual Review of the North of England Zoological Society

www.chesterzoo.org



The North of England Zoological Society is the charity that runs Chester Zoo and our conservation campaign, Act for Wildlife.

VISION & MISSION

OUR VISION IS FOR A DIVERSE, THRIVING AND SUSTAINABLE NATURAL WORLD.

OUR MISSION IS TO BE A MAJOR FORCE IN CONSERVING THE LIVING WORLD.

Chairman: Bruce Ursell

GRATEFUL THANKS

This is my first report and sadly the first thing that I must mention is the untimely death of our President, His Grace the Duke of Westminster who was a staunch supporter of the zoo and all that it stood for. His enthusiastic encouragement will be missed.

Thanks to the efforts of the management team and our dedicated staff the zoo has again received a record-breaking number of visitors. Membership has also increased to its highest level. All of this has contributed to our ability to invest in the physical zoo and enhance our ability to pursue our various programmes in support of our charitable purpose.

2016 was also the first time that we had a large-scale deployment of dedicated volunteers who have had a significant impact on our visitors' experience. We are grateful for the time and effort that this enthusiastic team make available to help communicate the conservation message and their love of the collection. We will add to the team during 2017.

Our zoo's reputation and the image of our staff have been enhanced by the exposure generated by the Channel 4 series "The Secret Life of the Zoo" one of the channel's most watched programmes in 2016. This is the most high profile example of the success of our PR team who are responsible for so much of the media coverage that we have managed to obtain throughout the year.

We must now look forward. We are in the middle of further capital investment and the team is in the throes of developing our plans for the next 15 years to ensure we continue to develop in pursuit of our charitable aims. 2017 will see the opening of further immersive exhibits within Islands. In addition Oakfield is in the middle of a two-stage enhancement that will bring about much needed, but discreet, modernisation to this iconic part of the zoo.

The 82nd NEZS AGM took place as usual in the Lecture Theatre and was well attended. The 2015 report and accounts were formally approved. Professor Richard Griffiths was elected to the Board of Trustees after a period as a co-opted Trustee. Under the terms of our articles, my predecessor as Chair, Peter Wheeler will be stepping down as a Trustee at the forthcoming AGM. In addition to Peter, Tony Williams, also a past Chair, has decided to step down. They are the two Trustees with by far the longest service on the Board. They have guided the Board and Executive team through a period of considerable change during which the zoo has consolidated its position as a leading attraction and conservation focused unit. We are grateful to them for their contribution to bringing the zoo to its current position. The Society has been fortunate to have had the benefit of their efforts.

Trustees of the North of England Zoological Society

NORTH OF ENGLAND ZOOLOGICAL SOCIETY

President (1987 – 2016): His Grace the Duke of Westminster, KG, CB, CVO, OBE, TD, CD, DL

Vice Presidents: The Rt Hon Lord Wade of Chorlton, kt, JP, The Hon Lady Jane Heber-Percy

The North of England Zoological Society (NEZS) is the charity that runs Chester Zoo and our conservation campaign, Act For Wildlife.

The Board

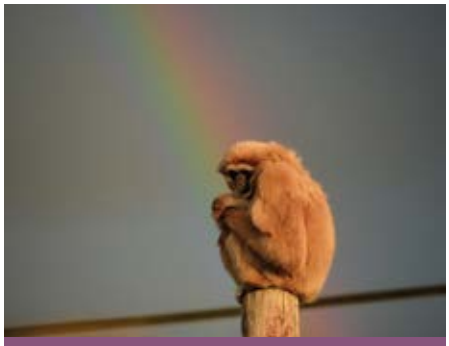
The North of England Zoological Society (NEZS) is a charity and like any charity it is controlled by a Board of Trustees who are Directors for the purposes of company law.

The Board is responsible for the management and administration of NEZS business – Chester Zoo and its conservation campaign Act for Wildlife. The Board discharges its responsibilities primarily in consultation with, and by delegation to, the executive team, led by the Chief Executive and Chief Operating Officer who implement the Board's policy.

Our Trustees during 2016 (names in bold are pictured):

Mr Malcolm Ardron
Mr Will Beale
Prof Malcolm Bennett
Ms Catherine Buckley
Prof Stefan Buczacki (who stood down at the 2016 AGM)
Mrs Rebecca Burke-Sharples
Mrs Sandra Donnelly
Prof Richard Griffiths
Prof Russ Newton
Miss Angela Pinnington
Mr Bruce Ursell
Mr Simon Venables
Prof Peter Wheeler
Mr Tony Williams

HIGHLIGHTS OF THE YEAR



A Lar gibbon welcomes in spring

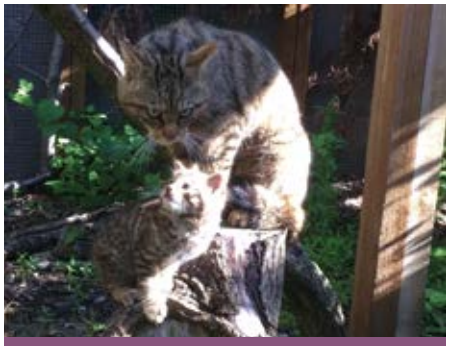
The Eastern black rhino calf 'Gabe' steps out for the first time

Banteng birth provides welcome boost to rare species

Amphibian project strikes gold at 'Zoo Oscars'

Rare aquatic plants reintroduced in Lancashire to reverse long-term decline

First ever Malayan tapir born at Chester

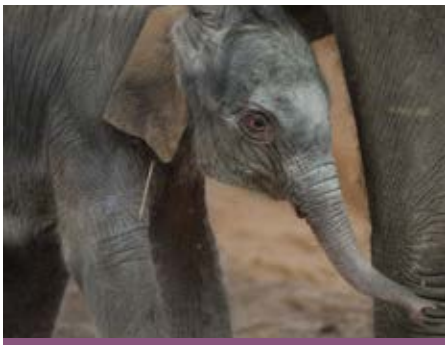


Carnivore experts breed Britain's rarest mammal

Critically endangered Northern bald ibis chicks hatch

Male okapi 'Stomp' arrives from German zoo

Tiny otter pups learn to swim



Female elephant calf 'Indali Hi Way' born

Rare Rothschild's giraffe born on Boxing Day

Dr Mark Pilgrim

CHIEF EXECUTIVE'S REVIEW

2016 was another tremendously successful year for us. We welcomed 1.9 million visitors, far more than ever before and I believe more than any UK zoo or wildlife attraction has ever attracted in one year. There many reasons for this success and some, such as delightful animal births and excellent television exposure, are evident throughout the pages of this report.

The need to generate increased income to enable our mission - to be a major force in conserving the living world, is tragically, also greater than ever before. The Director General of the International Union for the Conservation of Nature (IUCN), Inger Andersen, commented "*We live in a time of tremendous change and each IUCN Red List update makes us realise just how quickly the global extinction crisis is escalating. Conservation action does work and we have increasing evidence of it. It is our responsibility to enhance our efforts to turn the tide and protect the future of our planet*."

As a conservation and education charity NEZS, Chester Zoo is fighting the extinction crisis in the three key areas; breeding species for which there is a conservation need, support of conservation projects in natural habitats and inspiring visitors to make personal changes to the benefit of wildlife; all three of these key areas being underpinned by sound science.

Selecting a single highlight of each of these for 2016 from the huge number of examples, is a very difficult task, however a birth of great importance during this period was that of Gabe, a male Eastern black rhinoceros. Gabe was born to mum Ema Elsa and his sire is Kifaru, one of the most genetically important animals in the European breeding programme as he has very few relatives. Gabe will grow to become extremely important for the future of this critically endangered species.

As planned on the back of the *Islands* development we have reinforced our conservation measures in South East Asia through our hosting and employment of a Programme Officer for the IUCN Asian Wild cattle Specialist Group and part support of the chair's costs. A major part of this is to support Action Indonesia – an action plan for the Banteng, Anoa and Babirusa. This project brings together both zoo and field conservation with our Programme Officer and Curator of Mammals visiting Indonesia to promote the importance of cooperative breeding programmes at the Indonesian Zoo Association meeting, and surveying potential field conservation locations for *in situ* projects.

Here in the UK, through our Wildlife Connections initiative we inspired community group leaders to become 'Wildlife Champions', they gained skills and knowledge to help them decide how their community group could help their local wildlife.

All of our work depends on our highly skilled, dedicated and passionate people and I was delighted during 2016 that Dr. Simon Dowell, an experienced conservation scientist, joined our Executive team as Science Director, a key role within our organisation responsible for leading the areas of Conservation Science, Discovery and Learning and Field Programmes.

Of course none of this work delivering our mission can happen without strong financial support and in 2016 the Mission Enabling teams delivered an exceptionally strong commercial performance. On page 6, our Chief Operating Officer, Jamie Christon explains what has led to these achievements.

It is an incredible privilege to be the Chief Executive of NEZS, Chester Zoo; it is an extraordinary place with amazing species and incredible people focused on enabling and delivering our conservation mission. My sincere thanks to everyone involved.

Jamie Christon

CHIEF OPERATING OFFICER'S REVIEW

A year on from sitting and writing about the remarkable success of the zoo in 2015, I would never have imagined being fortunate enough to repeat those words again twelve months later.

The physical growth of the zoo site and the reputation of the *Islands* development we opened in the summer of 2015 continued to drive visitors through the gates from day one of 2016. Over the cold winter months, we saw visitors peaking at over 8,000 a day some weekends as our members and a wave of brand new visitors to the zoo came to see our animal collection and its continuous development as both a conservation education charity and major visitor attraction.

As the BBC One drama "Our Zoo" seemed to tour the world, airing in Australia and the USA, Channel 4's brand new series "The Secret Life of the Zoo" attracted audiences of over 1m each week telling the real life story of what goes on at Chester and the unique relationships between keeping staff and our animal collection. This spurred on even more visitors to come and see the stars of the show as it ran through the spring.

After a couple of years of absence and by popular demand, 23 animatronic dinosaurs arrived in Chester from Texas and spent the summer wowing our visitors. These creatures were landscaped in our award winning gardens in the centre of the site and were a huge success, especially during the school holidays.

The summer was topped off with us jumping on the back of the Pokémon craze and organising 3 evening character hunts which raised £47,000 for 3 conservation projects overseas.

Always focusing on driving visitor numbers, especially in the off peak months, we teamed up with experience creators, Wild Rumpus, to develop a product to market to our visitors over Autumn half term. "The Enchantment of Chester Zoo" was enjoyed by over 20,000 visitors during the 10 day period and created lots of interest in our nocturnal species as well as an enjoyable show for our visitors.

Regular visitors and members will be aware that over the last 4 years we have built up The Lanterns into a "must do" pre-Christmas event. This year was no exception and with additional dates and more evening slots we turned a large part of the zoo into a festival of illuminated models of many of the animals at the zoo, along with a great team of actors. The event was a huge success and attracted over 62,000 evening visitors.

The success of The Lanterns was partnered with the return of "The Secret Life of the Zoo" with a second series, which broadcast through December, again promoting our mission and charitable activities.

Talking of numbers, our membership continued to increase, peaking at over 87,000 by year end. Again this was a further 15% increase on the record numbers in 2015. As a result of a thriving membership, our total visitors reached 1.9m, which is a 12% increase on the previous year.

The economic impact of Chester Zoo was highlighted in a report at the end of the year which showed our contribution in the North West of England totalling £47.7m Gross Value Added. The report highlighted Chester Zoo as a significant employer, a major driver of the regional visitor economy and a site of excellence in conservation science and education.

I wrote last year that the biggest challenge was to repeat the success of 2015. Well, we did it in 2016 and now work begins in starting to deliver the Strategic Development Plan in 2017 and onwards. Work began in late 2016 with a phase two development in *Islands* and the start of refurbishment and regeneration work at Oakfield House, the former home of our founder George Mottershead. George's philosophy was "always building" and as we move into a new phase of the life of Chester Zoo we will continue in this vein.

The primate playground - A new home for Chester Zoo's Sumatran orangutans and silvery gibbons

AWARDS

BIAZA (British and Irish Association of Zoos and Aquariums) Awards

- **Gold Research Award for a three-year project measuring the global educational impact of the world's zoos and aquaria.**
- **Gold Award - Chester Zoo, Madagasikara Voakajy & SWEP Paignton Zoo - Joining Forces: International Zoo and national collaboration to save Malagasy amphibians**
- **Silver award for 'Flutterback' – Return of the large heath butterfly.**
- **Gold awards for ZSL London Zoo, Beale Park, Bristol Zoo, Chessington Zoo, Chester Zoo, The Deep, Dudley Zoo, Lakeland Wildlife Oasis, Tilgate Nature Centre & Reaseheath College - BIAZA Fen raft spider project**

Visit England Quality Assured Visitor Attraction

Visit England Gold Award 2016

The *Islands* shop was shortlisted for 'Best Museum/Visitor Attraction Gift Shop' at the Retail Greats Awards.

Organisation of the year award at the UK Heart Safe Awards

Lifesaver of the Year at the UK Heart Safe Awards

A partnership achievement award from the Countess of Chester Hospital NHS

Shortlisted for Organisation of the year in the St. Johns Everyday Heroes award

A NATURAL VISION

Throughout 2016, our Trustee-approved strategy 'A Natural Vision' informed and guided our teams in planning, achieving and developing our mission and supporting business activities.

Strategic objective 1

To ensure that our conservation and educational activities, both in the zoo and globally, achieve the greatest conservation impact.

GASHAKA BIODIVERSITY PROJECT
LED BY CHESTER ZOO

Gashaka Biodiversity Conservation Project in Nigeria

This means:

- having more control and influence over our field programmes;
- ensuring that we get the most conservation impact from the collection;
- understanding the expertise and specialisms of our staff and development of new skills required;
- empowering people to make environmentally positive life style changes;
- evaluating the conservation impact of our activities;
- ensuring that we consider the environmental sustainability of all that we do.

Strategic objective 2

To be a world class 'must see' visitor attraction, in terms of quality, service and enthralling experiences.

Our immersive butterfly exhibit

This means:

- providing immersive, authentic experiences, for visitors across all sectors of society, so increasing the reach;
- providing a personalised visitor experience;
- establishing and evaluating what it means to be 'world class';
- consistently provide high quality visitor facilities;
- maintaining year-round, high quality visitor experience;
- continuous improvement of site presentation standards.

Strategic objective 3

To be a centre of excellence for animal and plant care based on sound scientific principles.

A young orangutan

This means:

- providing best practice animal and plant husbandry and care;
- ensuring our facilities are fit for the purpose of providing excellent care;
- focusing our science to support conservation and animal welfare;
- sharing our skills and experience both internally and externally.

Strategic objective 4

To ensure long term commercial viability through excellent business practices.

Products on sale at the zoo's shop

This means:

- broadening our income base via new markets, products, funding and land use;
- developing better intelligence and market analysis and exploiting this data to better understand our customers;
- working smarter to drive down costs;
- increasing winter revenue;
- revision of the pricing strategy.

Strategic objective 5

To ensure that our staff are recognised as being at the heart of the organisation and influence the success of everything we do.

Our staff getting involved with the Go Orange campaign

This means:

- helping people innovate, assessing leadership and capability and producing a people development plan;
- ensuring we have excellent recruitment, selection and induction processes;
- improving staff facilities and staff welfare;
- developing a culture that means that everyone is an ambassador for our work;
- training and development including succession planning and building capacity;
- developing a system of reward and recognition through pay and benefits;
- initiating cross-functional working groups that build in flexibility.

Strategic objective 6

To ensure an excellent external reputation that builds trust and allows us to influence our stakeholders.

Chester Zoo winning a Marketing Cheshire award

This means:

- developing and creating a clear brand and awareness of what we want to be known for;
- receiving industry recognition across multiple disciplines through awards;
- protecting our reputation and having robust crisis management processes;
- developing strategic lobbying on the issues that we feel strongly about;
- ensuring greater public engagement with our science and technology, conservation and commercial activities;
- continuing liaison with our partner organisations and peers, e.g., BIAZA, EAZA, WAZA, IUCN, ALVA;
- providing support and expertise to targeted zoos throughout the world in partnership with like-minded organisations to improve the general public perception of zoos.

Andean Bear

Conserving species of LATIN AMERICA

Our Latin American programme this year has been incredibly diverse across the region and range of species involved. Our work in support of the Bermudan Government has grown and as well as working in the field and supporting a PhD we are now keeping critically important groups of Bermuda skink, Bermuda killifish and Bermuda snail in the zoo. All of these species have incredibly small ranges and are right on the edge of extinction in the wild in Bermuda.

Our Mexican work has continued to focus on some of the very rarest fish and amphibians; in the zoo we have successfully bred the critically endangered Crescent zoe and the Golden saw-finned goodeid, a species which is now completely extinct in the wild. We have continued to work on conservation translocation of these species in Mexico and this year working with the Mexican Fish Ark, the Crescent zoe was reintroduced to springs in Teuchitlan, Jalisco, Mexico. We are also working with Lake Patzcuaro salamander, an amphibian right on the edge of extinction, and the group of 20 animals at the zoo represent very important genetic lines to prevent extinction of this species. We also had success in breeding our Socorro doves, another species which is totally extinct in the wild and only survives as a result of birds kept and bred in captivity.

Our Chester Zoo Fellow at WildCRU, University of Oxford, Dr Ximena Velez-Liendo began fieldwork on the Andean bear project in July; she is carrying out surveys on bears and conflicts in the region, working on behaviour change in the hope of improving tolerance and perception of bears through education. We are also carrying out a pilot study using camera and hair traps to monitor bears in remote mountainous areas of Bolivia. Our Andean bears took a significant step forward in the zoo with *Lima* having her first ever cub, sadly it only survived a few days, but as her first attempt we now have very high hopes of successfully breeding the species during 2017.

During the year we started working with some highly threatened new Latin American species at the zoo; joining our conservation collection were a pair of critically endangered Cotton-top tamarins, now one of the most threatened primates. Also new was a critically endangered Ecuadorian bromeliad plant, which is now restricted to just two populations in mangrove forest; exactly the same habitats that our staff have been working in to survey roosts of the threatened Ecuadorian amazon parrot. Also new to the collection was the Trinidad stream frog, a beautiful threatened frog which has a tiny natural range in the north of the island of Trinidad.

In Brazil we have been supporting important work on Giant armadillo, Giant anteater and Lowland tapir; especially looking at threats in the Cerrado region where animals conflict with agriculture and are often run over on the busy roads. In Chester Zoo it was a significant year for two of our Latin American carnivores; our new Bush dog pack has continued to grow and by the end of 2016 there were 11 dogs, whilst the long-awaited arrival of a new male Giant otter gives us hope for 2017 and the prospect of breeding this endangered species.

Finally we were delighted by the exciting discovery at the start of July that we had 137 juvenile Montserrat tarantulas from one of our females. She had mated back in November 2015 and since then been in her burrow where we couldn't confirm whether breeding had been successful until the emergence of the babies. This is a great success and is the first time this species has ever been successfully bred in captivity.

Wild Rothschild's Giraffe in Uganda

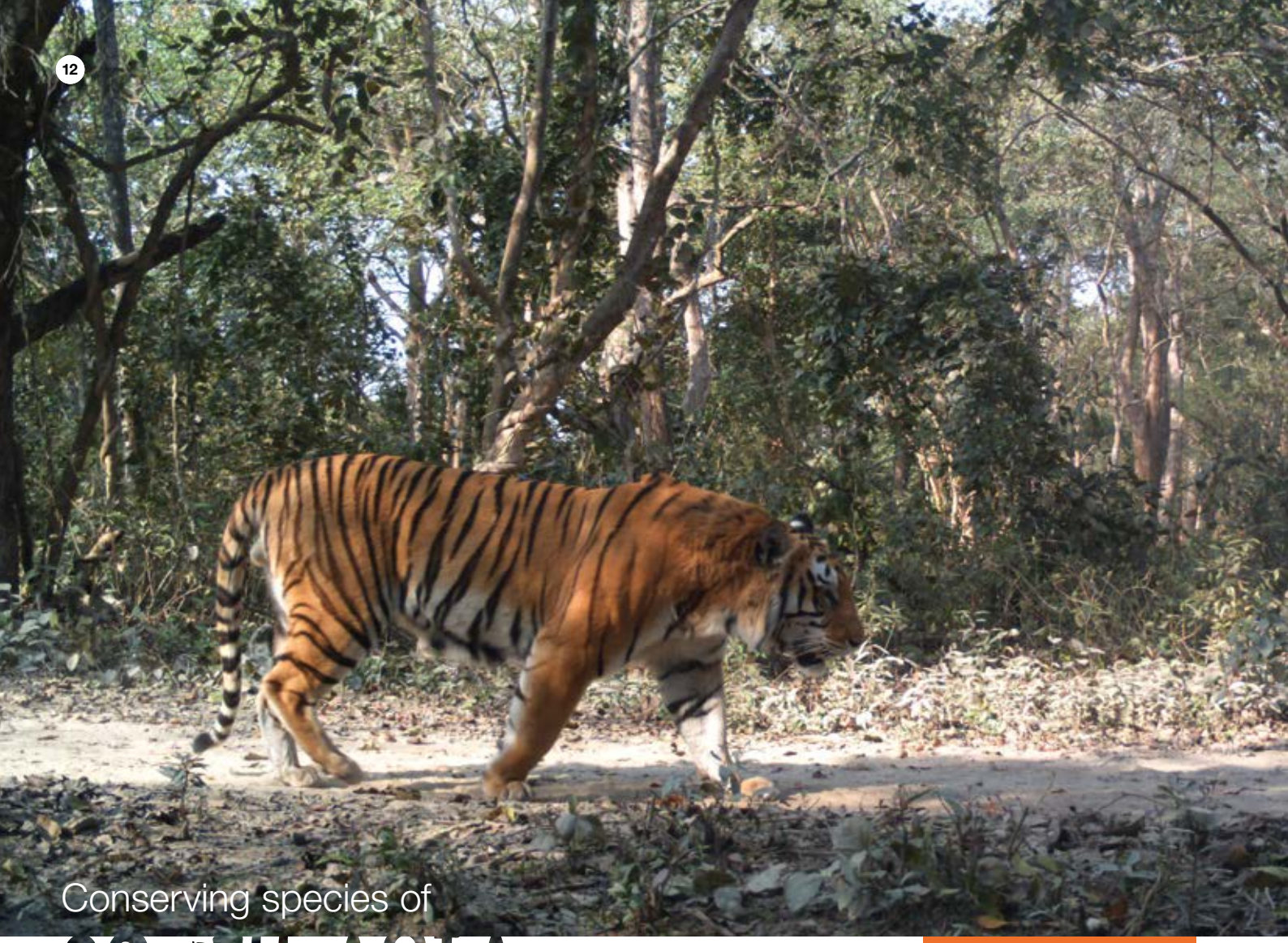
Conserving species of AFRICA

The year has seen some significant progress with our key species and field work in Africa. It's been a busy year for giraffe conservation in which all giraffes were internationally recognised for the first time as being threatened with extinction by the IUCN. In the zoo we continued to grow our herd of Rothschild's giraffe, one of the very rarest subspecies, with the birth on Boxing Day of *Murchison,* bringing the zoo herd now to a total of ten animals. Meanwhile our staff were busy in Uganda and South Africa working on giraffe conservation and surveys. In the Kidepo National Park in Uganda we assisted with the GPS collaring and DNA sampling of one of the last populations of Rothschild's giraffe.

Our commitment in Nigeria has continued and we have developed a new two year strategy for the Gashaka Biodiversity Project focussing on biodiversity surveys. In the Gashaka Gumti National Park education centre we have worked with the Nigerian National Park service to install 16 new information panels about the importance of the park and wildlife.

In the zoo we have been making progress with several of our important Africa programme species; continuing our long standing success with breeding in West African black crowned crane and breeding for the first time White-crested turaco and Red-winged starling. Across our grasslands we had births of Grévy's zebra, Roan antelope, Western Sitatunga and Warthogs. The year also saw significant changes to our African wild dog group, moving animals in and out of the zoo to put us in a position to breed this endangered species and we have high hopes of puppies in 2017.

It's been a very busy year for rhinoceros conservation in the zoo and our field programmes. As the threat of poaching continues we provided funding to maintain and improve security to a number of important rhino populations in East Africa, and had staff involved in anti-poaching work in South Africa. We were also again proud to be a major sponsor for the Maasai Olympics. The event concluded months of conservation-related education meetings and a series of regional sports competitions between four participating manyattas (villages) in the Tsavo-Amboseli region and the event has engaged over 1400 Maasai people on the importance of wildlife conservation. Finally a major birth during 2016 was that of *Gabe*, the male Eastern black rhinoceros on the 16th January. *Gabe* was born to mum *Ema Elsa* and will be an extremely important part of the European Endangered Species Programme which we coordinate here at Chester Zoo for this critically endangered species.



First picture of a Bengal Tiger caught by camera traps in Nepal

Conserving species of SOUTH ASIA

At the zoo we work with some of the rarest turtles in the world and this year saw significant developments in two of our South Asian turtle species. We were successful in breeding the Chinese three-striped box turtle (sometimes called the Golden coin turtle); this is a critically endangered turtle that has been almost driven to extinction by Asian markets. We have also, after many years of searching, managed to obtain a male Zhou's box turtle to join our two females at the zoo. This is one of the most enigmatic turtles; it is believed to occur in China where it may already be extinct in the wild, but has only ever been found in trade markets and never in the wild. Obtaining a young male is a crucial step if we are to breed this turtle in the future and help prevent its extinction.

Asian elephants continue to be the cornerstone of our South Asian regional programme and the Assam Haathi project in India has had a busy year. We have continued to analyse the wealth of data we have on elephant movements to investigate the impact of mitigation measures on their seasonal movements and in conjunction with the IUCN SSC we ran a workshop on Human-Elephant conflict in Assam, India. We have also been providing training on improving productivity in small scale agriculture to local villagers in Assam. Right at the end of 2016 we were thrilled to welcome a new addition to the zoo's herd of Asian elephants, *Indali*, a female was born to mum *Sithami Hi Way* on the 16th December and she has immediately had a huge impact on the behaviour of our herd and especially her older sister *Nandita*.

Our Bengal tiger work in Nepal has developed hugely during the year and the community-based social marketing approach to changing social norms and collective behaviours is exciting. Our ambitious community survey in the region has been completed and is now being analysed. During the coming year we hope to begin camera trapping in the Bardia National Park and complete activities to mitigate risk of conflict with tigers in the four communities in which the project is working.

Our long standing association with the Sichuan Forest Biodiversity Project in China has continued during the year, protecting biodiversity and reducing human disturbance in the five Sichuan reserves where we work. Chinese pheasants have been a focal group for this work over the years and during 2016 we have started to work with Reeves pheasant in the zoo, a threatened species endemic to China which occurs in the very reserves we are working to protect. We also had another highly successful breeding season with our Cabot's tragopans, another threatened endemic Chinese pheasant.

In the zoo, changes to our South Asian regional programme species included the departure of *Komala*, our young female Greater one-horned rhinoceros who was sent to a zoo in Turkey as part of the European coordinated breeding programme for this vulnerable species. Her departure allows us to begin breeding with the species again which will commence in 2017. Finally an exciting new addition to the conservation collection is the arrival of four young Chinese crocodile lizards, a beautiful lizard species facing a very high risk of extinction in the wild in China and North Vietnam. As these individuals mature we hope to start a coordinated breeding programme to help prevent extinction of the species.

Wild golden mantella in Madagascar

Conserving species of

MADAGASCAR & MASCARENES

Two important threatened Madagascan fish species joined the zoo's conservation collections in 2016. A group of 32 Damba joined the zoo from a private collection. This vulnerable species is very seldom kept and our group could be one of the few breeding groups in Europe. We also obtained 25 Kotsovato Madagascan cichlid, another vulnerable species with a highly restricted range in Madagascar, and we successfully bred the critically endangered Madagascan killifish.

We continued our work on the conservation of a number of critically endangered amphibians, much of it in collaboration with our partners, Madagascar Voakajy. In January, the Chester Zoo expedition visited the Mangabe area of Eastern Madagascar to assist with research and monitoring of the Golden mantella frog that is confined to this region (see page 32 for further details). The movements of this brightly coloured but poorly known species were tracked using marking technology developed at the Zoo.

This field research is providing data on population numbers, distribution and the ecology of this species and contributes to development of a new national action plan for the species. Part of this plan includes the need for pond restoration and reforestation and we funded continued activity in this area. The Golden mantella project won a gold award at the BIAZA conference in June.

A similar frog species, the Harlequin mantella, is now restricted to just a handful of ponds and research to understand its ecology and conservation was carried out in 2016 with technical and financial support from Chester Zoo. We continue to make plans to bring a group of these frogs to the zoo for conservation breeding. In October, another visit from Zoo staff coincided with national workshops to progress the conservation of both the Golden and Harlequin mantella and our ongoing role in the conservation of these species was discussed. The Mangabe region will be a focal area for future activities – as well as the golden mantella the forests harbour populations of lemurs including aye ayes and indris and we will support surveys to determine their abundance in relation to local community projects designed to enhance their protection.

A new arrival to the collection in 2016 was the Madagascan giant jumping rat and following the arrival of the first pair in the zoo three offspring have already been born. We imported two female critically endangered Radiated tortoises to join our current group; these will be genetically very important breeding females in our group.

Our partnership with the Mauritian Wildlife Foundation (MWF) was enhanced this year with our commitment to provide staff to coordinate the conservation breeding facilities in Mauritius. For many years our keepers have been providing expertise in bird husbandry to projects in Mauritius, but this increased focus will provide dedicated support throughout the year to the breeding facilities and support activities saving threatened endemic species such as the Mauritius cuckoo-shrike, Pink pigeon and Mauritius kestrel, helping provide suitable animals for planned released programmes. One of our bird keepers visited Mauritius from mid-October to the end of November to monitor the Mauritius Cuckoo-shrike breeding season in partnership with the MWF. During this time he successfully rung two chicks, which have now fledged and are the first rung cuckoo-shrikes in Mauritius. This will help us to learn more about where the chicks go after fledging.

Other technical and advisory support is provided for bat husbandry, and our keeper visited this year to advise on husbandry at the breeding centres in Mauritius, and for the development of education activities such as the Learning with Nature project and particularly the techniques used to evaluate impact. In addition, our Conservation Science team explored the need and opportunity for a human-wildlife conflict project focussing on the endemic Mauritius fruit bat, which is an endangered species causing extensive damage to mango and lychee crops, and is persecuted as a result. We have designed and are overseeing a rapid assessment survey of the situation involving measurements of actual and perceived crop damage, market dynamics, and perceptions, beliefs and behaviours related to the conflict. Meanwhile, the government of Mauritius decided again to carry out a cull of fruit bats, much to the alarm of conservationists and the IUCN, making this work all the more urgent. We are also supporting an independent filmmaker, Diane Gueho, with a small grant towards a short documentary about the issue.

Cuckoo shrike chicks being hand fed in Mauritius

Sumatran Orangutans at Chester Zoo

Conserving species of SOUTH EAST ASIA

We are working with a wide variety of species from this large and diverse region which contains some of the most threatened habitats on earth.

Successful breeding of two highly threatened primate species from this region was a boost to their conservation. An endangered Moloch gibbon, a first for the zoo, was born on the 10th January from the newly arrived pair. During the year we had another 3 critically endangered Sulawesi crested macaques born in Monsoon Forest, in *Islands*; our troop continues to get bigger and by the end of the year we had 17.

In addition to the important breeding populations of both Bornean and Sumatran orangutans in the zoo, we contribute to orangutan conservation in a number of other ways. We have supported the work of the Hutan-Kinabatangan conservation programme in conserving Bornean orangutans and the fragile rain forest where they live for many years. Effective dissemination of their work is vitally important to increase public support for orangutan conservation so in June, staff from our marketing team visited the project and ran workshops with HUTAN to assist in the delivery of their new website and social media strategy. We began work on the new HUTAN education strategy and we supported the Head of their education team to attend the annual International Zoo Educators Conference in Argentina in October, where he met with our own Discovery and Learning staff to develop the strategy. We also provided major funding and technical support for the Orangutan Veterinary Advisory Group programme, which provides training and capacity building to veterinarians and project managers through SE Asia and the group held a successful meeting in Kota Kinabalu, Sabah (Malaysian Borneo) in July.

We are working to develop an artificial hornbill nest box which has been undergoing tests with our Rhinoceros hornbills in the Monsoon Forest. We are using this to develop a design which holds temperature and humidity levels stable that can then be used in the field to assist in wild hornbill breeding efforts in Borneo. We have also provided financial support for attendance of experts at a number of meetings to develop an action plan for the critically endangered helmeted hornbill in Borneo.

Nowhere is the Asian songbird crisis more acute than in Java, where a number of previously widespread species are close to extinction in the wild. Our breeding pairs of Javan green magpie had a hugely successful year with four chicks from two different pairs successfully fledged; a first for this species outside Indonesia. Thought to number less than 100 in the wild, this success is a huge milestone in the formation of a conservation breeding programme helping to save the species from extinction.

We have been working closely with our partners at the Cikananga Conservation Breeding Centre (CCBC) in Java to rescue Javan green magpies and other species in most urgent need. We assisted with the construction of new aviaries in July in response to the urgent need for new facilities to house critically endangered birds in the breeding programme. These include the Black-winged mynah for which a reintroduction programme is planned for 2017. As part of this we prepared a habitat assessment plan and began community awareness and education work that will precede and accompany the release. We have also recruited two new Chester Zoo PhD scholars with Manchester Metropolitan University to research bird trade in South East Asia and Black-winged mynah ecology. In addition, four critically endangered Bali starlings bred at the zoo were sent to Cologne Zoo, with a view to being returned to Indonesia as part of a reintroduction programme.

This was also a great year for breeding our Sumatran laughing thrushes with nine chicks successfully fledged. Despite the captive successes sadly this species continues to decline in the wild and during 2016 it moved up the red list to endangered status.

The Indonesian island of Sumatra has one of the highest number of threatened endemic species of any island on the planet and we are working with a number of key species from there. New to the collection were Sumatran Prevost's squirrel which have settled in well and already produced a litter of three offspring. The summer saw the departure of our two young male Sumatran tigers from the last litter to zoos in France and the United Kingdom as part of the conservation breeding programme for this species. A new species of pitcher plant, *Nepenthes rigidifolia*, has been added to the zoo's conservation collections. This spectacular species is thought to exist on only one site in North Sumatra, and is critically endangered in the wild. We provided continued financial and technical support for the Sumatran painted terrapin project in the field; 958 eggs were collected and

666 hatched giving a 70% success rate which is much higher than in previous years.

The zoo's herd of endangered Javan banteng continued to grow during the year and we now have 11 animals. A female Lowland anoa was born on the 2nd June and a male Babirusa was born on the 1st July. To help with the conservation of these three species in their native Indonesia, Chester Zoo has a close collaboration with the IUCN SSC Asian Wild Cattle Specialist Group, providing support through a programme officer employed at Chester Zoo and a range of technical input from various zoo departments. Our support has enabled Global Species Management Plans (GSMPs) for these three species to be produced and initiated. Seven Indonesian zoos were visited in July by a team of experts to assess husbandry practices and knowledge and skills of keepers. Following this, the first breeding and transfer recommendations were written up for Indonesian zoos and distributed by the Indonesian government in November. This will ensure that Indonesian zoos cooperate in breeding these species in captivity. We also advised and helped coordinate training plans for Indonesian keepers to facilitate the implementation of the breeding recommendations and training for the care of rescued anoa and babirusa.

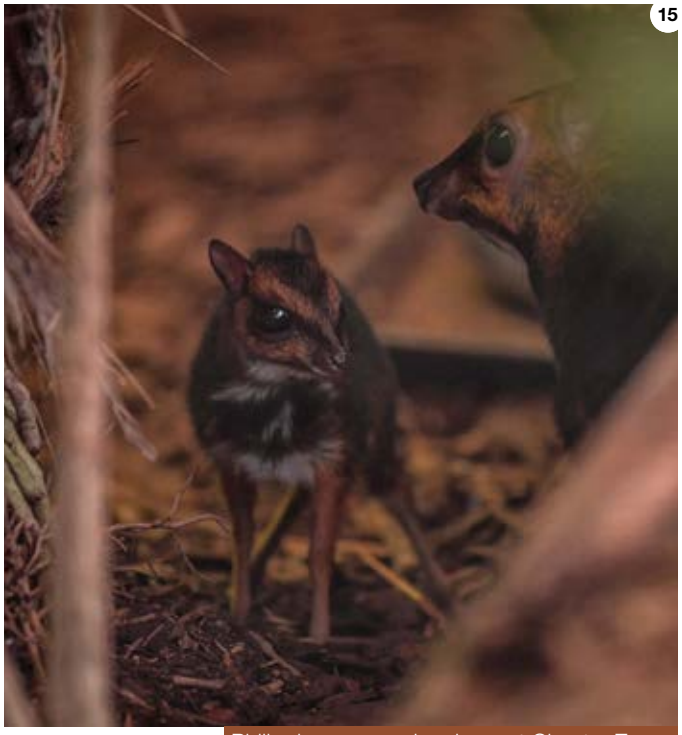
We also developed an online survey for Indonesian zoo educators to understand what educational activities are currently carried out in Indonesian zoos and where support may be needed, and we produced species interpretation for Indonesian zoos to help raise awareness of conservation issues to Indonesia zoo visitors.

A new project on the critically endangered Javan warty pig began in July with an interview survey at six different sites in West and Central Java and subsequent surveys of six sites by our Indonesian research partner Shafia Zahra. Thanks to camera trap footage captured, we can confirm that warty pigs still occur at two of three sites visited so far, Banjar in West Java and Blora in Central Java. These are the first photographs of this species in the wild.

The Philippine is home to a number of endemic deer species, all of them threatened with extinction. The birth of a Balabac mouse deer was a first for Chester Zoo and the UK and we supported surveys of this endangered species in the wild in southern Palawan province. Also in Palawan province, surveys of the critically endangered Calamian deer showed that the only remaining viable population is less than 500 animals on Calauit island where they are severely threatened by poachers. The current proposed action is to remove some of the deer to a conservation breeding centre in Narra, Palawan, as a step towards future reintroductions to new sites in 2017. Meanwhile a Philippines spotted deer calf was born at Chester Zoo on Boxing Day and we continued our financial contributions to the Philippines Biodiversity Conservation Foundation to survey this species in the wild and maintain breeding centres on the islands of Negros and Panay.

We also continued our support for the Philippines Cockatoo Conservation Project, run by the Katala Foundation based in Palawan. This project continues to have long term success, protecting a significant percentage of the Philippine cockatoo population. This season saw a small drop in population numbers due to El Nino and its impact on food availability but nevertheless populations remain strong. Activities at Iwahig, a large forest site with existing populations of cockatoos, are expanding with training in LAWIN (spatial modelling and monitoring tool) being conducted. A rapid biodiversity assessment was carried out with the aim of getting critical habitat protection status for the site which will provide greater security against land encroachment and potential development.

Wild Javan banteng



Philippine mouse deer born at Chester Zoo

Following emergency support to rescue over 3000 confiscated Palawan Forest turtles in 2015 we also continued our support for the Palawan Turtle conservation projects, including community-based monitoring and forest protection activities in Dumarau and funding new activities to monitor the turtles that were rehabilitated and released after the confiscation. Another species from Palawan that arrived in the collection this year was a pair of threatened Palawan binturong.

Through the William Oliver Conservation Scholarship we supported the involvement of 25 students in surveys of important sites in the Negros-Panay region. These surveys are part of ongoing activities to fully assess the existing populations and status, and also potential reintroduction sites, of Philippine hornbills, Philippine spotted deer and Visayan warty pig. In addition we supported forest wardens protecting and reforesting the Alcoy forest on Cebu, and site of several endemic critically endangered species such as the Cebu flowerpecker and Cebu cinnamon.

A significant birth during this period was that of an endangered male Malayan tapir on the 11th July. There was also a litter of five Asian short-clawed otters born in Chester Zoo on the 8th July. This species was once numerous but continues to decline and is now facing a high risk of extinction so the breeding success of our pair is important.

We made significant progress with our work with South East Asian corals and we are now holding 32 different species in the zoo and working on propagation techniques.

In May a team from Chester Zoo conducted one and a half months of intensive research on Komodo dragons on Longos Island as a follow up to the discovery of the population there in 2015.

The team also found Yellow crested cockatoos on the Island, which is the first record of this species in north Flores, and a roosting site of thousands of fruit bats that they believe provides an alternative source of food for the dragons. In August, a second previously unknown population of Komodo dragons was discovered on the island of Flores.

Scottish Wildcat

Conserving species of UK AND EUROPE

We work with some of the UK and Europe's most threatened wildlife and are actively involved in a number of projects to translocate native species back into the wild into areas from where they have disappeared.

Six critically endangered Northern bald ibis bred at the zoo during 2015 were released on the 9th February at Vejer in southern Spain as part of the Andalusian Government's conservation translocation programme. A further seven Northern bald ibis were bred this year at the zoo and sent to ZooBotánico de Jerez, Spain, where they will join the reintroduction programme at Vejer in 2017.

Baer's pochard remains one of the most threatened European species and the wild population could be as low as 250 birds. We very carefully manage the breeding of this critically endangered species and in 2016 we produced nine chicks at the zoo.

A highly significant birth during this period was a Scottish wildcat kitten, sired by the new male who arrived in March. This is one of Britain's rarest mammals and we are part of a coordinated breeding and translocation programme for the species.

We provided ongoing support to the Vincent Wildlife Trust in this year's reintroductions for the Pine Marten Recovery Project. 39 martens (20 in 2015 and 19 in 2016) have now successfully been translocated from Scotland to mid-Wales. We assisted with the design, construction and subsequent removal of eight soft-release pens and with radio tracking of the released pine martens. In the spring we were very excited to learn that five kits were born to two of the released females.

We partnered with the Wirral & Cheshire Badger Group to conduct a badger bait-marking survey on the Adlington Estate, east Cheshire in early October. The survey enabled us to identify the presence of at least four social groups across the estate and successfully estimate their territorial boundaries. As well as improving current knowledge on badger populations in Cheshire, this information will prove invaluable when vaccination resumes in 2017.

After a number of slightly below average years between 2012 and 2015, dormouse surveys at our study site in North Wales in 2016 have recorded a bumper year with more animals seen in October than ever before (90 individuals). It seems likely that 2016 is a year in which some females may have had two litters, and young of the year may also have bred. These years are hard to detect, but microchipping the dormice gives us a unique opportunity to identify these uncommon behaviours, which are rarely confirmed in UK dormouse populations. These bumper breeding years are thought to be critical for maintaining dormouse population levels.

Since 2012, we have worked with the Lancashire Wildlife Trust (LWT) to restore the nationally declining large heath butterfly to Heysham Moss, where it hadn't previously been seen for over 100 years. While LWT undertook restoration work at Heysham to ensure the habitat would be suitable for the butterflies, we began a carefully managed translocation programme in 2013 based at the zoo. In 2016 a further 73 were head-started in the zoo and released onto Heysham Nature Reserve in Lancashire. The population will now be monitored until 2020 to assess the sustainability of the population and the success of the reintroduction programme.

We have been asked to develop the Studbook Programme for the Sand lizard and facilitate the long term management programme for reintroduction. Our experience with other species' studbooks will facilitate the compilation of information from different private breeders and zoological institutions. We are working on getting new genetic material into the zoo for the Sand lizard reintroduction project to start again.

We are working with two rare British aquatic plants. We have been propagating Grass-wrack pondweed, for reinforcement of wild populations in partnership with the Canal and River Trust. We have also been carrying out the temporary rescue and conservation translocation of Floating water plantain; plants had to be removed from the Rochdale Canal, which were cared for here at the zoo before being returned to the wild and planted back in the canal when it was suitable once more.

We have again been propagating and planting in the wild native Barberry. These plants will be grown by local communities as part of the Wildlife Connections project and planted along canal towpaths as part of the Barberry Highways Project, in order to create new habitats for the rare and protected Barberry carpet moth.

Nature Reserve

NATURE RESERVE

Our Nature Reserve is located just north of the main car park on land running down to the canal. It has proved both an important habitat and a valuable resource for introducing people to their local wildlife. In September we held our first Wildlife Connections festival there and this was a major highlight of the campaign attracting over 3000 visitors and inspiring children and adults alike with activities from the toad road game, to bird spotting, bug hunting and pond dipping. Permission for the Phase 2 Nature Reserve planning application was approved at the end of August, and we have been granted funds from WREN for its development which will involve planting wildflower meadows, creating wetland habitats and providing new wildlife viewing facilities in 2017.

SCIENCE

Science Centre

We aim for our scientific research to help in decision making that improves the management of the animals and plants in our care, influence the sustainability of wild populations and inspire the next generation of conservation scientists. Scientific activity occurs across the zoo and beyond and involves our highly skilled and experienced staff in many divisions.

Research projects are identified and prioritised by Chester Zoo's Science Committee which includes staff from the Collections and Science Directorates. We prioritise research that has a positive impact on the living world, either directly through improved animal management or indirectly through the promotion of conservation action. Research projects are completed by Chester Zoo staff or professional researchers and postgraduate students in collaboration with our academic partners. In 2016 Chester Zoo staff were actively involved in 54 research projects which fall under our six broad conservation and science specialisms, a small sample of these are highlighted in the sections below.

In 2016 Chester Zoo formed a partnership with the University of Oxford to work together on major challenges in conservation by combining a number of our overseas projects with top quality science. Over the next seven years this collaboration will span ten conservation scholars and fellows placed into Chester's conservation projects around the world. This collaboration will provide new research to assist conservationists in developing innovative approaches to mitigate human-wildlife conflict, promote sustainable development and livelihoods, and to monitor populations of endangered species in the wild.

Supporting and Disseminating Scientific Research

A large part of our scientific research includes disseminating our findings both nationally and internationally with peers and the wider public. In 2016 we contributed to 18 scientific publications, delivered 60 presentations, and submitted 13 posters at conferences, meetings, symposia and seminars.

In partnership with Marketing Cheshire, Chester Zoo organised and delivered a successful international symposium. The Commercial and Conservation Breeding Symposium was part of the 'Britain is Great' campaign and brought together animal breeders from industry and conservation; over 100 delegates shared ideas and techniques and met potential collaborators. We also attended a number of science outreach events in 2016 including attending the EuroScience Open Forum, the largest interdisciplinary science meeting in Europe where we connected with a number of professional researchers. Across public science festivals we engaged with numerous members of the public at activities held both in the zoo and venues in the city of Manchester. Further details of our activities can be found in our annual Science Review (www.chesterzoo.org/conservation-and-science/resources).

Conservation Scholars & Fellows

Our conservation scholar and fellow programme developed further in 2016 with an additional five scholars beginning their research, studying a diverse range of topics across a variety of species from population monitoring of Ecuador Amazon parrots, scent communication and physiology of Eastern black rhinos, human-tiger conflict in Nepal, conservation genetics of Mountain bongo and exploring the immune system of Asian elephants. We are now supporting a total of seventeen scholars from ten institutions. Conservation Scholar Ee Phin Wong from the University of Nottingham Malaysia Campus completed her studies this year researching the management strategies of Asian elephant-human conflict in Peninsular Malaysia, and has gone on to employment as an Assistant Professor at the University. We welcomed our first Conservation Fellow in 2016, Ximena Velez-Liendo who is studying Andean bears in Bolivia (see Latin America section on page 10 for details).

Javan Green Magpie, Indonesia

Our specialisms

CONSERVATION BREEDING AND MANAGEMENT

As threats to the environment and the animals and plants which live in it increase, conservation breeding in zoos and intensive management of wild populations are vital conservation tools for preventing extinction. Chester Zoo is an acknowledged world leader in conservation breeding and management and this specialism underpins much of our conservation work. During the year we worked with more than 580 species of animals and more than 1100 important species of plants at the zoo and countless species in our conservation management in the field.

Coordinated and collaborative breeding programmes are critical for the survival of many species. During this year 131 different species of the animals we keep were managed in international cooperative breeding programmes. As a world leading zoo not only do we participate in, but we also manage and coordinate 15 of these conservation programmes; these include critically endangered species such as, Black rhinoceros, Javan green magpie and Lake Patzcuaro salamander.

Coordinating these conservation breeding programmes is a demanding and skilled task involving international liaison, monitoring populations, keeping studbooks, analysing demographic and genetic data and making recommendations; all on an annual basis! We also manage five National collections of plants; orchids (Pleurothallidinae), pitcher plants (*Nepenthes*) and cacti (*Copiapoa, Matucana* and *Turbinicarpus*).

These skills are increasingly important for managing small populations in the wild as nowadays many threatened animals and plants occur in small fragmented populations and require intensive management not unlike many populations within zoos. We have been using our specialisms around the world to help save many species; in Indonesia we are working on song birds, banteng, anoa and babirusa with breeding centres, zoos and the government to better manage these small populations. In the Mascarenes our long-standing programmes have continued with birds, bats and plants, helping to restore populations and habitats. In South Africa we have funded research into Cape mountain zebra and Black and White rhinoceros populations that are fragmented and isolated in reserves.

Moving and releasing animals and plants (conservation translocation) is another critical conservation management technique for which Chester Zoo has international renown. Whilst conservation translocation is not appropriate for all species it is being used in much more innovative ways to bring conservation benefit. We are involved in conservation translocation programmes for many species, including Northern bald ibis, Black-winged starling, Bali starling, Mauritian cuckoo shrike, Pine marten, Scottish wildcat, Crescent zoe fish, Large heath butterfly, Barberry, Floating water plantain and Limestone woundwort, sometimes actually providing animals and plants for release into the wild, whilst in other cases utilising our specialist skills to plan and increase the chances of success of conservation translocation programmes around the world.

Red Panda cub

Our specialisms

WILDLIFE HEALTH AND WELLBEING

Caring for more than 580 species of animals at the zoo gives us a wealth of knowledge and expertise on safeguarding the health and wellbeing of wildlife. These skills are essential for the wildlife we care for in our zoo habitats but they are also extremely valuable for applying to safeguarding wild populations and training wildlife professionals around the world. Our veterinary team plays a crucial role in this, but so too does everybody involved in the day to day care of all our animals.

We are constantly looking for ways to enhance the quality of life of all the animals that we care for at Chester Zoo. Sometimes this involves renewing, renovating and building new habitats for them such as the new nocturnal facilities in the *'Tropical Realm'* opened during 2016 for the endangered Aye-aye and Madagascan giant jumping rats, but often subtle changes in routine, feeding regime, and social groupings can all be used to improve wellbeing in our animals. This is carefully monitored in order to assess impacts and following the opening of *'Islands'* in 2015 more than 2000 hours of data have been collected and evaluated showing significant positive impacts on the species monitored such as our Sumatran orangutans, Sulawesi macaques and Southern cassowaries.

Our expertise in wildlife health and wellbeing have been widely used further afield from the zoo, either by training visiting wildlife workers from many of our projects, or by our own staff involvement in the field. We have continued our long-standing work in Mauritius caring for threatened endemic birds and especially incubation and hand-rearing techniques vital for the restoration of several bird species on the edge of extinction. Our veterinary experts have once again been involved in bringing together and developing skills in veterinary professionals in South East Asia through the support we give to the Orangutan Veterinary Advisory Group.

Ecuador

BIODIVERSITY SURVEY AND MONITORING

A vital first step in conservation is being able to find, identify and monitor animals and plants; this involves a diverse array of specialist techniques and skills. The staff at Chester Zoo have many years of experience of working with a multitude of different species both here in the zoo and around the world. These skills are perfect for biodiversity survey and monitoring and some of our staff are renowned for their work with particular groups of animals and plants. This holistic view of our staff working both in the zoo and the field is one of our key strengths and an example of the way in which which Chester Zoo achieves conservation impact and prevents extinction.

During the year surveys as diverse as amphibians in Madagascar, elephants in India, Amazon parrots in Ecuador and beetles, butterflies and moths in South Africa have all involved our experts from the zoo. We have been using camera trapping, a technique involving cameras that are triggered remotely as animals pass by, to survey large mammals in several regions of the world. As part of our Gashaka Biodiversity Project in Nigeria we have been recording unique information on some of the mammals of Gashaka Gumti National Park, including Leopard, African Golden cat, Nigeria-Cameroon chimpanzee and the first ever records of Giant pangolin from Nigeria. In South East Asia similar techniques are being deployed to survey large mammals in tropical forest, including Javan warty pig, Banteng and Calamian hog deer.

More intensive monitoring often involves the need to handle and work closely with animals. The experience our team gains in the zoo can be invaluable for this process either to assist in this careful work or to train others in the requisite skills. Our experts have been involved in many projects during 2016; catching and monitoring critically endangered Bermuda skinks on Bermuda, DNA sampling and fitting collars to endangered Rothschild's giraffe and radio-tracking reintroduced Pine martens through Welsh forest.

Our staff expedition this year saw a team from the zoo visit Mangabe in Madagascar where the team were involved in two weeks of intensive survey of the wildlife in the forest. Surveys were carried out for birds and lemurs as well as small mammal trapping for rodents and tenrecs. The critically endangered endemic Golden mantella frog was the main focus of intensive monitoring to look at the numbers of individuals present in the different populations.

Villagers and elephants come face-to-face in Assam, India

Our specialisms

HUMAN-WILDLIFE CONFLICT

Human-wildlife conflict poses a serious, widespread and direct threat to hundreds of threatened species around the world and impacts millions of people's lives. Chester Zoo works to study and mitigate human-wildlife conflicts involving a variety of species held in the collection including Asian elephants in India, tigers in Nepal (reported on in the livelihoods & sustainable development section on page 23), Andean bears in Bolivia (see Latin America section on page 10), jaguars in Brazil, and fruit bats in Mauritius (see Madagascar & Mascarenes section on page 13).

In 2016, we enabled the creation of a global expert advisory group on this topic, the IUCN SSC Task Force on Human-Wildlife Conflict which was founded by our head of conservation science, Dr Alexandra Zimmermann. This task force provides advice and guidance for human-wildlife conflicts around the world. Communities that can safely share landscapes with wildlife are paramount for the future of conservation, but achieving this requires an interdisciplinary approach. The Human-Wildlife Conflict Task Force therefore brings together a range of expertise; members include biologists, social scientists, economists, anthropologists, social psychologists, peacebuilding experts, political ecologists and many others. In November, the task force held a workshop in India on human-elephant conflict in Asia in conjunction with the IUCN SSC Asian Elephant Specialist Group. The workshop discussed case studies about the needs and priorities for managing human-elephant conflict in 13 countries across Asia.

Our longest running human-wildlife conflict project is the Assam Haathi project in India which was started in 2004 in collaboration with our Assamese partner, EcoSystems India. The objectives of this collaboration were to facilitate the sustainable co-existence of elephants and people in Assam by promoting a community-based approach to elephant conflict mitigation and to characterise the movements of elephants and the incidents of conflict that occur when they come in to contact with people. The project has received two prestigious grants from the Government's Darwin Initiative.

By the end of 2016, the details of more than 3000 incidents of crop raiding and damage to property had been recorded. The villages and communities where the project began have instigated a variety of conflict reducing measures and constant monitoring for more than 10 years has revealed a dramatic decrease in the number of conflict incidents and area of crops damaged, showing the success of the project. We now have a unique long-term dataset that can be used to identify sustainable methods of conflict mitigation to facilitate the co-existence between people and elephants. We have been using this to develop the next phase of the project in which we aim to adopt a landscape approach to conflict mitigation across larger areas of Assam state and find more sustainable solutions which may include the community-led regeneration of forest patches and/or the creation of corridors to enable elephants to move through the landscape without persecution.

Reforestation in sustainable plantation

LIVELIHOODS & SUSTAINABLE DEVELOPMENT

The futures of the majority of threatened species in almost all parts of the world are inextricably linked with the livelihoods of the people living alongside them and as conservationists we must address the issues of poverty and economic development in order to provide sustainable protection for wildlife. Many of our field projects have a community focus and we are especially working to develop sustainable alternatives to environmentally damaging activities in a number of our projects across Asia.

In 2016 we began our new Living with Tigers project in Nepal, in partnership with Green Governance Nepal and with funding from the Darwin Initiative for a three year project. We aim to reduce the safety risk to people and livestock from tiger and leopard attacks and to build capacity to address poverty, improve wellbeing and thus reduce pressure on natural resources.

We are working in the buffer zone forest areas around the Chitwan and Bardia National Parks where dangerous encounters between people and tigers have increased and reports of human-tiger conflicts are rising. Most buffer zone households use forest resources such as firewood for cooking and fodder for feeding to their livestock. We have begun working with two carefully selected communities (members of Community Forest User Groups) in each national park by completing essential baseline household surveys to determine current livelihoods. Social Marketing consultant Dr Diogo Verissimo, trained the field team in the basics of community-based social marketing (an approach to changing social norms and collective behaviours). Predator proof pens and bio-gas stoves were installed as activities to mitigate risk of conflict with tigers. The intention is to alleviate poverty by diversifying livelihoods to reduce the costs of living near tiger habitats and ensure long-term support for tiger conservation. We will also be helping to improve protection and husbandry of livestock through improved veterinary care. With the help of our national partners we are working in a participatory approach with the communities to explore alternative livelihood solutions such as agriculture, artisanal handicrafts and micro-finance opportunities. Chester Zoo/Oxford University Conservation Scholar Amy Fitzmaurice was recruited to monitor the impact of this work on tigers through camera trapping and other survey techniques.

Commercial palm oil production in South East Asia is of considerable economic importance both to local communities by supporting employment and to regional and national Governments. Our concern is with the deforestation, loss of biodiversity and greenhouse gas emissions which have resulted from the rapid and unregulated expansion of unsustainable plantations.

Transforming the palm oil market to a sustainable and traceable supply is the most responsible path and the first step to ensuring that the palm oil industry impacts as little as possible on the biodiversity of the regions it is grown in. The Roundtable for Sustainable Palm Oil (RSPO) is the most recognised certification scheme globally, however currently only 20% of palm oil produced is certified, with a focus on manufacturers of products sold in supermarkets. Knowledge of sustainable palm oil in the UK catering industry is unknown and perceived to be more limited.

In 2016 we carried out research to identify existing knowledge and current procurement procedures in restaurants around the city of Chester. Part of this research aimed to identify the perceived benefits and barriers to adopting sustainable palm oil procurement in restaurants in Chester and tested acceptance levels for interventions. We found that 80% of respondents had no knowledge of palm oil as an environmental issue and around 40% were unsure whether palm oil was found in their products or not. Some respondents listed multiple barriers preventing them from using sustainable palm oil within their restaurants. From these, it is clear that respondents believe the biggest barriers to be cost, availability and knowledge. Despite the lack of knowledge and unknown use of palm oil, there was a high willingness to engage with us on the topic from local restaurants. To help, we developed a restaurant toolkit including practical tips to help businesses make and deliver their sustainable choices. Next steps in the project will include communication with survey participants to increase knowledge of sustainable palm oil and encourage uptake in the restaurant toolkit which is available to download from the Chester Zoo website.

Our specialisms

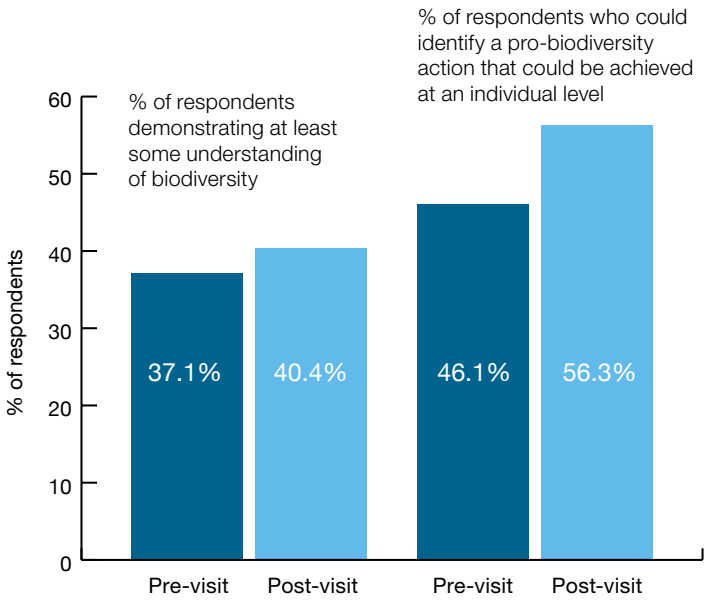
Amazed by Science

VISITOR AND COMMUNITY ENGAGEMENT

It is widely believed that visitor and educational programmes in zoos have a strong educational impact, but evidence to support this is surprisingly lacking. We are carrying out research to investigate both the short and long term impacts of our education and visitor engagement work and using the results to inform and improve our work going forward.

Chester Zoo's Safari Ranger programme is an education programme in which education staff visit schools and deliver zoo-related workshops for children ages 7-11. We have been evaluating the impact of this approach using surveys before and after the students took part. The surveys involved open-ended questions and drawing activities to assess the students' knowledge and attitudes towards zoos and conservation. The results of this research found a significant increase in knowledge and positive changes in attitude statements, in students who participated in the Safari Ranger Programme. This provides evidence upholding the educational impact of our Safari Ranger work and as a result of this we will be expanding this programme in 2017.

2016 saw the culmination of a three-year project measuring the global educational impact of the world's zoos and aquaria, co-led by our conservation social scientist and in collaboration with the World Association of Zoos and Aquaria. Over two surveys, 10,000 visitors to 30 institutions worldwide participated (including Chester Zoo). The study found that biodiversity literacy in zoo visitors increases significantly after zoo visits. Also, those visitors who were exposed to a coordinated educational campaign - Biodiversity is Us (www.biodiversityisus.org) - showed a significant increase in biodiversity understanding and in their ability to identify action they could take themselves to help biodiversity conservation (see figure right). This study provides valuable evidence reaffirming the important role of zoos and aquariums as providers of biodiversity-related education. The work was published in a prestigious academic journal and in June we were awarded a Gold Research Award at the 2016 BIAZA Annual Conference for this project.



Changes in understanding of biodiversity and action that can be taken at an individual level before and after a zoo visit – based on surveys carried out at 30 zoos worldwide.

Volunteers

Discovery and Learning

VOLUNTEERS

The Visitor Engagement Volunteer programme is a highly visible programme in the zoo, involving a team of 140 volunteers who inspire and enthuse the full range of zoo visitors with our species and conservation efforts. The volunteers benefit from a programme of valuable learning opportunities that can lead to progression in knowledge and skills and also extends social networks and increases wellbeing.

Impacts of the programme on the zoo and its visitors

Visitor Engagement Volunteers are effective in extending the zoo's capacity for face to face interactions with visitors. Since the start of 2016 volunteers have been responsible for over 100,000 interactions* with the public.

The zoo is receiving regular positive feedback from visitors about their interactions with volunteers.

Visitor Engagement Volunteers make a regular and frequent commitment to the zoo. In 2016 volunteers gave a total of 10,000 hours between them.

**interactions include giving directions, giving information on species and conservation conversations.*

Recruitment and training of volunteers

Those interested in volunteering are invited along to open day to meet some of the current volunteer team and take part in group activities which reflect the type of voluntary work our volunteers undertake. This is a chance for us to get to know them and consider how they might fit into the volunteer team.

A full application can then be made and if we are able to connect their personal interests with an available role we invite them along for training.

Volunteers entering the programme are given four full days of initial training and expected to provide assistance to zoo visitors for a minimum period of 6 months. Core training is given to recruits and prepares them for their role. The four sessions are led by the Volunteer Manager and relevant departments across the zoo. In 2016 a further 45 volunteers were recruited.

We currently have a total of 135 visitor engagement volunteers and 25 Fundraising volunteers.

Volunteers

DISCOVERY & LEARNING

In 2016 108,743 people visited the zoo as part of an organised educational visit. 22,529 took part in teaching sessions with our education team.

Wildlife Connections was one of our key campaigns in 2016 and one which not only involved the zoo's visitors, but also encouraged the wider public to become engaged with local wildlife, both in gardens and in community spaces. The dedicated webpage was launched at the beginning of the year and fun learning resources helped everyone to take action by making spaces wildlife friendly and creating simple habitats. The website included a form where nearly 1500 wildlife sightings were recorded during the year.

In the zoo, 2500 visitors took the first steps to helping their local wildlife by taking part in Zoo Ranger led activities, building toad abodes, bird feeders and nest boxes. The Jaguar Coffee House became the Wildlife Connections' hub with interpretive installations both there and across the zoo showing how everyone could become involved. Log piles, bird boxes, bug hotels and areas of wild flowers were installed over the zoo's site.

Outside of the zoo, engagement with almost 2500 people took place at events such as the Cheshire Show, RHS Flower Show Tatton Park and Manchester Science Festival. Funding from the Heritage Lottery Fund helped us do further work in local communities and we trained 57 school or community group representatives from Cheshire, the Wirral, Halton and North East Wales to become 'Wildlife Champions'. Over 100 people attended masterclasses with local experts, providing them with in-depth knowledge of a variety of native species. Our Community Garden Design Competition winners had their new garden built by members of the zoo's Horticulture and Botany team; this will be officially opened in early 2017. The Wildlife Connections Festival in September was a highlight of the year. This free two-day event was attended by over 3500 people and a wealth of activities and attractions entertained and educated the festival goers about native species and their role in helping to conserve local wildlife.

Bird spotting

Continuing our commitment to community engagement, our Safari Ranger repeat engagement programme was expanded following evaluation of the pilot of 2015 which showed a positive impact on students' conservation knowledge and zoo-related attitude. The topic for the 2016 programme was 'Protecting our Wildlife' which linked very closely to the Wildlife Connections' campaign. Engagement for this project was with 15 schools and 1500 KS2 pupils and involved two

classroom based workshops, a practical conservation session and a workshop with Emily Capstick. This drama practitioner ran choral speaking workshops in which the pupils performed her poems written from the Protecting our Wildlife linked literacy work. The culmination of the project was a celebration assembly in a number of the schools with pupils performing the poems and the Wildlife Connections' song to their school and parents. Evaluation of this repeat engagement model is ongoing.

The Safari Ranger programme continued in delivering traditional workshops and this free service delivered 200 of these, engaging with 5000 pupils and community groups across the region.

The wider Learning team was also involved in strengthening our relationship with local schools and communities and raising both the profile of the zoo and awareness of conservation issues. Attendance at the Manchester Science Festival and an ongoing project for years seven to nine students at Upton High School both focused on conservation science, on our UK conservation work and provided another opportunity to promote Wildlife Connections.

Further afield, the team provided and oversaw the fitting of interpretation in the education centre of the Gashaka Gumti National Park in Nigeria. 2016 also saw the roll out of a new interpretation style across the zoo and evaluation of the impact of this. In-zoo projects also included a refurbished Wetlands Aviary hide, touchscreen interpretation in the new Aye-aye enclosure, the Aquarium refurbishment and installing a bronze sculpture to celebrate 50 years of Boris, one of the zoo's chimpanzees, a favourite of the zoo's visitors. To accommodate this workload an additional two staff were hired on a temporary basis to provide content and graphics' support.

Three additional new part-time Learning Assistant posts were created to support formal and informal learning in the zoo. This provided us with the opportunity to offer four workshops at any one time to school groups and additional flexibility for visitor engagement. The learning centre underwent enhancement and refurbishment during the school summer holidays to provide a smarter learning environment with a movable dividing wall affording more flexibility in use of the space.

In-zoo workshops continued to run outside of the summer term, making best utilisation of the zoo as a unique learning environment, and Zoo Rangers maintained a high profile in delivering a plethora of activities including talks, touch tables, World Animal, Enrichment and Members' Days, storytelling, a Cub Scouts' sleepover and events to support and enrich Wildlife Connections, Dinosaurs the Next Adventure (stories, fossil digs), The Enchantment of Chester Zoo and Santa Storytime in Islands. In total, the Zoo Ranger team interacted with 13% of 2016's total zoo visitors.

2016 saw us launch a long desired initiative, Junior Rangers. This children's club for junior members aged between eight and eleven years old met every Sunday for six weeks to learn about animals and the zoo's conservation work in a fun and interactive way. Demand was extremely high and sessions were held both on Sunday morning and afternoon throughout the year. Activities were wide-ranging, from mini-beast hunts to behind the scenes tour of the glass houses and planting wildflower seeds. At the end of each six week cycle, Junior Rangers graduated with a certificate and pin badge presentation. The initiative was extremely successful and will continue into 2017 with additional sessions.

Very aware of the engagement power of the internet, social media and e-learning, we recruited a Digital Learning Officer at the beginning of 2016 with the view to creating a searchable database of resources on the Learning pages of the zoo's website. A huge number of these free and engaging assets now exist, including videos, posters, fact files, activities, trails and Wildlife Connections resources; all are free to download by teachers, students and the general public. The Digital Learning Officer also made use of the 360 projection system in Sumba School Room producing a film to complement the Santa Storytime. To further broaden communication and engagement with the learning sector, in 2016 we launched a Twitter account @learnatCZ.

Wildlife Champions

Safari Rangers

Visitor Experience

WELCOMING OUR VISITORS

The challenge for the Mission Enabling team this year was to try to emulate the record breaking results they achieved in 2015. However it was pleasing to see that the team rose to the occasion by not only welcoming more visitors than ever before but also setting some new records in both catering and retail too.

At the beginning of the year the focus was on our visitors by ensuring the visitor team were given the right tools and training they needed to make everyone feel welcome and enjoy their time with us. Over 400 members of staff were trained in a variety of areas including customer service, product knowledge and creating a safe environment. We also updated our guest feedback processes to enable us to further improve how we can listen to, and act upon, what our visitors were telling us.

In February we opened our newly refurbished *Bembe Kitchen* restaurant following a complete redesign and fit out. The menu was updated to provide our visitors with fresh seasonal salads, deli sandwiches, locally sourced pastries and a range of hot homemade dishes.

In May, we saw the return of our very popular *Dinosaurs! The Next Adventure* exhibition. This year visitors were able to see a host of new dinosaurs, a new range of interactive and educational activities and could also download a dinosaur app to unlock an augmented reality experience.

In October we launched a new event called *The Enchantment of Chester Zoo* in partnership with Wild Rumpus, who specialise in creating large scale outdoor family arts events. The event gave our visitors the opportunity to immerse themselves in live performance and music encouraging them to explore the zoo to find our nocturnal animals, learn about their super senses and help to save our animals and the zoo.

The Lanterns returned in December to welcome just over 62,000 visitors, growing again in popularity. New performance, animal lanterns and experiences combined to create a magical Christmas night time walk in the zoo.

Looking forward, the team has been busy planning *Play!* This will see the zoo introduce a whole host of new play experiences for our visitors to discover and will launch in time for summer 2017.

Dinosaurs! The Next Adventure

Islands Lazy River Boat Trip

CREATING A SAFE ENVIRONMENT

Another year has passed and it is during this time that we have been able to fully embrace *Islands* operationally into our zoo whilst giving us time to reflect on lessons learned as we continue to strive for excellence.

This alone would be a big enough challenge, however with almost 1.9 million visitors flocking to the zoo in 2016, it is vital that we continue to drive our standards even higher to ensure that each and every visitor has the best experience along with feeling safe and secure.

The Site Operations team which consists of Security, Health and Safety, First Aid and Maintenance & Environment have continued to put customer service, site standards, security and safety at the forefront of everything we do.

During the year we challenged ourselves by learning new skills and engaged in examples such as leadership and customer service training, advanced first aid (First Person on Scene) as used by First Responders and also various elements of the Security Industry Authority certification.

We delivered Project Argus and Project Griffin to various teams within the zoo as we strive to protect our staff, guests and our business from external threats. We continue to advance the knowledge in basic First Aid of all our staff by delivering Heartstart training which includes the use of defibrillators, and how to carry out effective CPR.

To enforce our skills and mitigate risk we also introduced a training calendar which allows the zoo to practice incidents, be they considered minor or major including a full scale incident in a simulated environment. This in turn immediately benefits our handling of incident management but also our plans in business continuity.

The team even managed to be able to celebrate our successes nationally as during 2016 we have been awarded the Best Partnership at the Local Authority Building Excellence Awards. At the Heart Safe awards, we obtained the Leisure & Tourism Organisation of the Year and also the Lifesaver of the Year award, being the only organization to win two during the evening. The latter award was due to saving the life of a young girl who suffered a cardiac arrest whilst visiting the zoo which in turn led to the team picking up The Countess of Chester award for their lifesaving skills along with the Partnership Award with all the other external teams who worked that day to save her life. She later came back to visit us which was certainly a memorable and emotional day for all involved.

We continued to improve all elements of safety through the use of technology and now handle all contractor and risk assessments through our Health & Safety management system, OSHENS. A new CCTV video management platform was deployed along with a large number of the latest CCTV cameras around the site and we also ensured that our fire and intruder alarms are automatically reported to our control room upon activation and immediate attention can be offered. To complement this, our Control Room underwent a complete facelift and we now have security officers on patrol around each area of the zoo to provide on the ground presence to protect our staff, guests, collection and assets alongside officers manning the control room 24/7. Finally, a total of seven defibrillators were installed at key locations around site to ensure that one is always a few moments away with some of these being in external cabinets for easy access. We are striving for a total of ten to be in place by the peak season so this combined with our advanced first aid and Heartstart training made available for all staff including our security officers on the ground will put our visitors in very safe hands indeed.

We have handled 861 First Aid incidents (198 staff and 663 visitor) which is a decrease of 69 when compared to 2015. The zoo related incidents decreased to 36 (11 staff and 25 visitors) and this trend shows a continued improvement as 2014 had 79 which dropped to 43 in 2015. Two RIDDOR reportable accidents were also reported in 2016 however the drop in cases has been recognized by our insurers so our work towards a safer environment will continue as always to be a priority.

Our maintenance team also had a record year dealing with 3,224 maintenance requests and 839 minor enhancements. To help support this number of cases and introduce efficiency along with advanced reporting and scheduling we will be deploying a computerised maintenance management system in 2017.

OUR FINANCIAL PERFORMANCE

2016 was another record year and thanks to our visitors, members and supporters our income rose by 18% in 2016 to £42.1m (2015: £35.6m). Total expenditure rose by 19% to £36.9m (2015: £30.9m) resulting in a £5.2m net increase in our funds (2015: £4.7m).

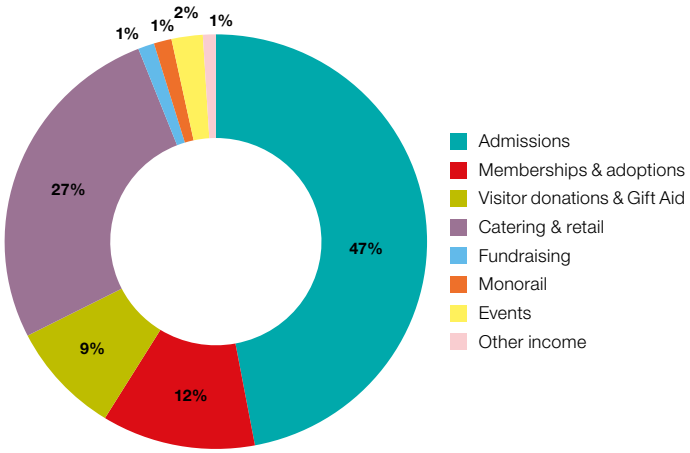
Income

The bulk of the Society's income came from the zoo's visitors and members, in the form of admissions and other charges. With total visitor numbers increasing 12% to 1,898,059 in 2016 and membership numbers increasing by 15% to 87,932, the related income, which also included income from our Lanterns event, rose by 20% to £26.9m.

As a registered charity the Society generates voluntary income from visitor donations, Gift Aid, animal adoptions, grants, legacies and other donations. Driven by the increase in visitors and offset by a reduction in grants and other donations this income rose by £0.6m in 2016 to £3.7m.

With investment made in improving our offer, the Society's trading subsidiary, Chester Zoo Enterprises Limited, which provides retail and catering across the zoo site, had a turnover of £11.4m in 2016 (2015: £9.8m).

The chart below shows where how we raise our money:



Expenditure

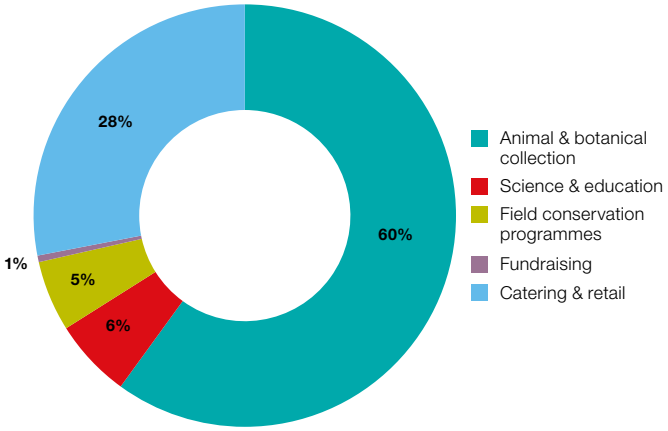
In 2016 we spent £36.9m (2015: £30.9m), excluding capital expenditure. 2016 expenditure included a full year's depreciation of *Islands*, which opened in summer 2015. The total depreciation charge for 2016 is £5.9m (2015: £4.4m). Costs also include a £1.0m contribution to the closed defined benefit pension scheme (2015: £0.9m). Prior year expenditure included the benefit of a £1.0m exceptional refund from HMR&C in relation to input VAT following a tribunal case.

Resources expended on our charitable activities, including the costs of maintaining the animal & plant collection, the visitor facilities, education and science and our field programmes, together with related support costs totalled £25.7m (2015: £21.0m). In addition we spent £0.2m (2015: £0.3m) generating our voluntary income.

By far the biggest element of expenditure related to our employees. Our average Full Time Equivalent (FTE) headcount for 2016 rose to 544 from 461 in 2015. A third of these employees worked directly in support of the Society's charitable objectives, either with our animal & plant collection or in education, science and research. In addition we benefitted from the hard work of a growing team of over 150 volunteers.

Chester Zoo Enterprises Limited made an operating profit of £0.6m in 2016 (2015: £0.5m) which was donated to the Society.

The chart below shows a breakdown of the Society's expenditure.



Capital expenditure

During 2016 we spent £5.3m on capital expenditure. This expenditure included improvements to the public roads around the entrance to the zoo, which had been a planning condition of *Islands*, together with refurbishment of a number of buildings across the zoo and investment in energy saving technology.

In the autumn of 2016 we commenced the redevelopment of Oakfield House and work started on the construction of a new habitat at *Islands* which will include a large state-of-the-art walkthrough bird aviary, a new home for the zoo's two sun bears and an impressive Malayan tapir exhibit.

Cash generated from operations of £11.3m (2015: £9.7m) was used to fund these capital developments and also to repay borrowings. At 31 December 2016 the Society had a net borrowing position of £3.2m (2015: £9.1m). Full details of our financial performance can be found in the 2016 Trustee's Report and Financial Statements.

Dreamnight

OUR TEAM

Our people focus developed yet again during 2016. At peak we had a record permanent headcount of 397 along with 372 seasonal staff totalled 769 staff. We hit new heights on many fronts this year. Significantly, the number of applications received and processed by the team grew from 5,000 to 17,144.

Roles and Structure

In total the principal accountabilities of 219 different roles were reviewed. Some 5,000 separate definitions were created and attached to our on-line performance development review (PDR). Although initially a huge task it led to greater clarity when awarding PDR scores, given greater transparency regarding standards of behaviour required for each score and with it an overall more professional feel to role expectations. We also extended the project to cover Check 1, 2, 3 (our probation checks) and seasonal end of contract reviews.

Training and Development

Training continued to be headline news with 603 training days delivered throughout the year covering diverse areas such as:- computer literacy, customer service training, operational training (chainsaw, tractor, trailer & fork lift training). Our internal programme of short, succinct training sessions called Zaps! continued with over 2,000 events being delivered by our own in-house experts (new subjects include Wildlife Connections, Field Programmes and Energy). We partnered with West Cheshire College and provided Level 2 courses in Team Leading, Business Administration, Dementia Care, Nutrition and Health, Safe Handling of Medicines and Principles of Working with Individuals with Learning Difficulties. We also delivered two new courses training people in autism and dementia awareness. Both courses led us to developing two new initiatives one called Autism Champions and the other Dementia Friends. These people have had more intense training and are better equipped to deal with difficult guest facing situations that sometimes occur.

Recognition

Chester Zoo won a special 'best of the best' award at the High Sheriff's Annual Awards. The £10,000 award was split between Discovery & Learning and HR. The award was caveated that the money had to be spent on "Young People". As a result a Young & Future Leaders course was developed which saw 24 employees work in groups to resolve live issues facing the zoo. It is hoped that this can be further developed into a future leader programme in the forthcoming years.

Chester Zoo was pivotal in securing BIAZA sub-group status for HR and hosted a number of HR professionals from zoos and wildlife attractions from all around the UK in October.

Madagascar

MADAGASCAR EXPEDITION 2016

In January 2016 the annual Chester Zoo expedition travelled to Madagascar for two weeks, to help conserve the Golden mantella frog – a tiny orange Critically Endangered frog less than two grams in weight and only one cm in length!

Madagascar is home to some of the world's most extraordinary wildlife and the majority of species found there exist nowhere else on earth. Our partners Madagasikara Voakajy (MaVoa) work on a number of vital projects to help safeguard the diverse range of wildlife on this island where deforestation is threatening to wipe out hundreds of species.

We have partnered with MaVoa for a number of years now and the aim of this expedition was to assist with an ongoing study, conducting important research into the Golden mantella's population size, using a specific mark recapture technique developed by Dr Gerardo Garcia, Chester Zoo's curator of lower vertebrates and invertebrates. As the frogs are so small and have no natural markings, it's impossible to identify individuals. The elastomer marking technique involves using implanted fluorescent silicone under the skin of the frog making it easier to identify whether they've been recaptured, and this allows us to estimate the population size at each pond. Gaining accurate results on how many remain is essential for the long term management plan to protect them in the wild.

The expedition team, of 12 people, also ran primate surveys using camera traps, and bird surveys in the Mangabe forest. They managed to identify 63 bird species in 6 just days and created the first bird list for the area, which will be useful for ecotourism development. They also visited a number of schools to engage with local communities to promote local biodiversity and raise awareness of the importance of local wildlife.

This expedition offered a great opportunity to share technical expertise between Chester Zoo and MaVoa. Half the team was selected to provide skills needed for the technical element of the expedition, for example our keeper Pip showed MaVoa staff how to delicately mark the wild frogs so this work can be continued in the field. But, the expedition also offers an opportunity to staff from any area of the zoo, giving them a chance to get involved in field conservation, so half of the expedition team were volunteers whose names were drawn out of a hat!

The Golden mantella population survey work is now complete and has given us a much better understanding of the population and how to protect it into the future. Our partnership with MaVoa will continue, diversifying into partnerships supporting other species and habitats to ensure their survival on this unique island.

The children with the mascot

Horticulturalist Maile delivering a workshop in Assam

KEEPER FOR A DAY

The Chester Zoo 'Keeper for a Day' initiative provides a great opportunity for the public to experience a day in the life of a zoo keeper. The experience buys a full day working alongside staff on one of our animal or plant sections; the income generated is used to support staff involvement in various conservation projects, conferences and meetings. In 2016, the fund enabled 24 staff to participate in a variety of activities around the world; this is in addition to the huge amount of staff travel that usually occurs as part of our on-going field projects.

Keepers can utilise the Keeper For A Day scheme to participate on field projects. This often enables our specialist zoo-based skills to be applied in a field setting, but also provides zoo staff with a much better understanding and appreciation of field projects. Such trips strengthen relationships with field partners, and often result in staff returning as 'project champions'. This year staff assisted with radio tracking giraffe in Uganda; surveying bats in the Mascarenes; improving horticulture skills in human-elephant conflict impacted communities in Assam; and advising on rhino identification and painted dog husbandry in East Africa.

In Borneo, a visit from a member of the marketing team helped projects develop media and communication strategies; and staff from our marketing and fundraising team visited Indonesia to learn about the Asian songbird crisis first hand – knowledge that will be applied back in the zoo as we develop the Singing for Songbirds campaign.

Finally the scheme also helps support staff who identify opportunities to further build on their training and capacity. This year we had staff attend and present at the International Elephant and Rhino Foundation conference in Singapore; visit Jersey and Cologne zoos to share knowledge on bear husbandry and welfare; and attend the Giraffe and Okapi Conference in Chicago.

Marketing Manager Jenny with some of the HUTAN team in Borneo

OUR CAMPAIGNS & PARTNERSHIPS

Enchantment

Our lead campaigns for 2016 featured Wildlife Connections, Islands, Dinosaurs, Enchantment and Lanterns, giving our visitors many reasons to explore the zoo during the course of the year.

Islands was still the main reason to visit for many, and we complemented the national advertising campaign for *Islands* with a more regionally targeted campaign to promote the return of Dinosaurs to the zoo.

We also invested in our Act for Wildlife brand in 2016, developing a new website in September, with the launch supported by a media partnership with The Guardian and Observer.

Towards the end of the year we launched our first campaign with the Times Educational Supplement, a leading educational title, the aim being to promote school visits and raise the profile of Chester Zoo as a leading educational charity.

We also launched a new 'Conservation and Science' section of the website in May – a section aimed at those with a professional or academic interest to showcase our work, outline of specialisms, promote our specialists and to present our publications.

As a result of the significant growth in membership over the recent years, our promotion of membership shifted in 2016 to drive retention, with events such as The Enchantment providing another reason for members to visit, as well as encouraging standard visitors.

85% of bookers who responded to our post visit survey said that they had visited the zoo on the day specifically to see The Enchantment.

Our visitor research also told us that over the summer of 2016 93% of visitors said that they would definitely recommend us (compared with 87% in 2015). Value for money scores increased with 86% saying their visit to the zoo was good or excellent value for money compared with 78% the previous summer.

Event sales continued to grow in 2016 and in both August and September nearly double the amount of weddings were delivered compared to the previous year. A new rhino encounter successfully went on sale at the end of September.

In February we enjoyed being the focus of Channel 4's series The Secret Life of the Zoo, produced by Blast TV. The advertising value equivalent for The Secret Life of the Zoo's 6 one hour episodes (plus the subsequent weekly Sunday repeats) reached an enormous £24m. January saw a huge promotional push across all media to promote the series, which positioned the zoo as a passionate, dedicated organisation with expert staff, delivering first rate welfare for endangered species in the collection.

With the success of series one, series two followed in November after a summer of filming. Total viewing figures for episode one reached more than 2.7m (factoring in the repeat and on demand catch up). Viewer reaction on social media was overwhelming in its praise for the zoo, with huge numbers pledging to visit as a result of viewing the programme. The zoo PR team tapped into (and helped create) this momentum with a full scale social media campaign before, during and after each episode reaching more than 750,000 people in the first week alone. Press previews and reviews before and during the series - generated by the zoo's PR team in conjunction with the C4 press office - were plentiful and also extremely positive (with The Guardian comparing the show to Planet Earth II and crediting it with a revival in wildlife television).

Over the summer months the world's first ever known hatching of a Montserrat tarantula in zoos generated widespread coverage across international, national and regional media (including the Washington Post, Sydney Morning Herald, Daily Telegraph, BBC Radio 4 Today, BBC online, ITV news). The UK first breeding of the Javan green magpie generated similar mass exposure (Daily Mail, BBC News online, The Times, The Daily Telegraph, Daily Express, Sky News).

Facebook followers grew 19% in 2016 to more than 335,000, helping to increase the impact of our content and messaging. One single video post about the birth of a rare Scottish wildcat was viewed on our page more than 4 million times.

One of the highlights of the year was the widespread coverage for the zoo in leading the formation of the first European Endangered Species Breeding Programme for the mountain chicken frog, allied to field conservation initiatives as part of a new action plan to save the species from extinction. The story was aired simultaneously on the breakfast shows of BBC One TV, BBC Radio 4 (Today Programme), BBC Radio 2 and BBC Radio 5Live, while also featuring as a lead story on BBC.co.uk and across all regional media outlets. Meanwhile, more than 60,000 people read the story on social media through CZ's Facebook and Twitter posts alone.

THANK YOU FOR YOUR SUPPORT

Our generous and devoted supporters have done it again! 2016 saw some of our most creative and ambitious fundraising campaigns to date: capturing trends, embracing fun and touching the hearts of wildlife-lovers everywhere.

The high-profile and emotive 'Never Forget' forget campaign truly brought the public together to fight against the EEHV virus and to defiantly act for elephants. We raised a staggering £100,000 which will go directly to research helping us understand the virus, develop better treatments and ultimately find a vaccine.

The Heritage Lottery fund have continued their support, this time helping us to launch our Wildlife Connections project by funding Wildlife Champions who will work directly with communities to link them with the nature all around our homes.

Generous grants from a number of local trusts including The Philip Barker Charity and The Holroyd Foundation (High Sheriff's Award for Enterprise), along with sponsorship from Halliwell Jones Chester, allowed us to grow our Safari Ranger outreach programme – getting more rangers to schools in our region and taking a little bit of the zoo out to our communities.

Local and national corporate support continues to grow, with new partnerships secured with 3D Squared, Convatec, Darwin Escapes, Stagecoach Merseyside and Toyota. And what really delights us is how many companies want to stay supporting us in the long-term; relationships with Airbus, Bank of America, MBNA, M&S Bank and Urenco help us to plan for the future and make an ongoing impact to our global conservation projects.

Tapping into the biggest craze of 2016, our Pokémon Go fundraising events (pictured) saw visitors come in their droves to collect a plethora of virtual beasties, whilst simultaneously (and in just 3 days!) raising over £47,000 for conservation work in Madagascar, and our Songbirds and Never Forget campaigns. We even had a Poké-proposal!

Our Challenge Champions have stepped up a gear, raising an incredible £15,000 by completing the toughest of physical events; cycling, running, scaling and scrambling – we doff our hats to your tremendous endurance and dedication!

And to those who have left the most personal of gifts in 2016; to our major donors, lifetime supporters, and those who have left gifts to celebrate the lives of treasured loved ones, we hope Chester Zoo will continue to create and evoke delightful memories.

In short, we simply want to say a huge thank you to all our donors – you are amazing!

With thanks to all our 2016 supporters:

Airbus
Adlington Hall
3D Squared
Bank of America Merrill Lynch
Convatec
Darwin Escapes
Hafren Water
Investec Wealth & Investment
M&S Bank
MBNA
Mother London
My Claim Solved
Stagecoach Merseyside and South Lancashire
Toyota Motor Manufacturing Ltd
Urenco UK
Waters Corporation
We are Vista Ltd
Zebra Finance
Charles Brotherton Trust
Heritage Lottery Fund North West
Philip Barker Charity
The Eric & Dorothy Leach Charitable Trust
The Holroyd Foundation
The Peter Foden Family Charitable Trust
The Topinambour Trust

Carole L Brown
Ruth Rendell
The Ampelos Trust

Charly & Kirsten Haysom-McGahan

And certainly not forgetting our amazing fundraising volunteers, challenge champions and those donors who wish to remain anonymous.

Front cover: Solo the Malayan tapir calf goes on his first outdoor adventure at Chester Zoo

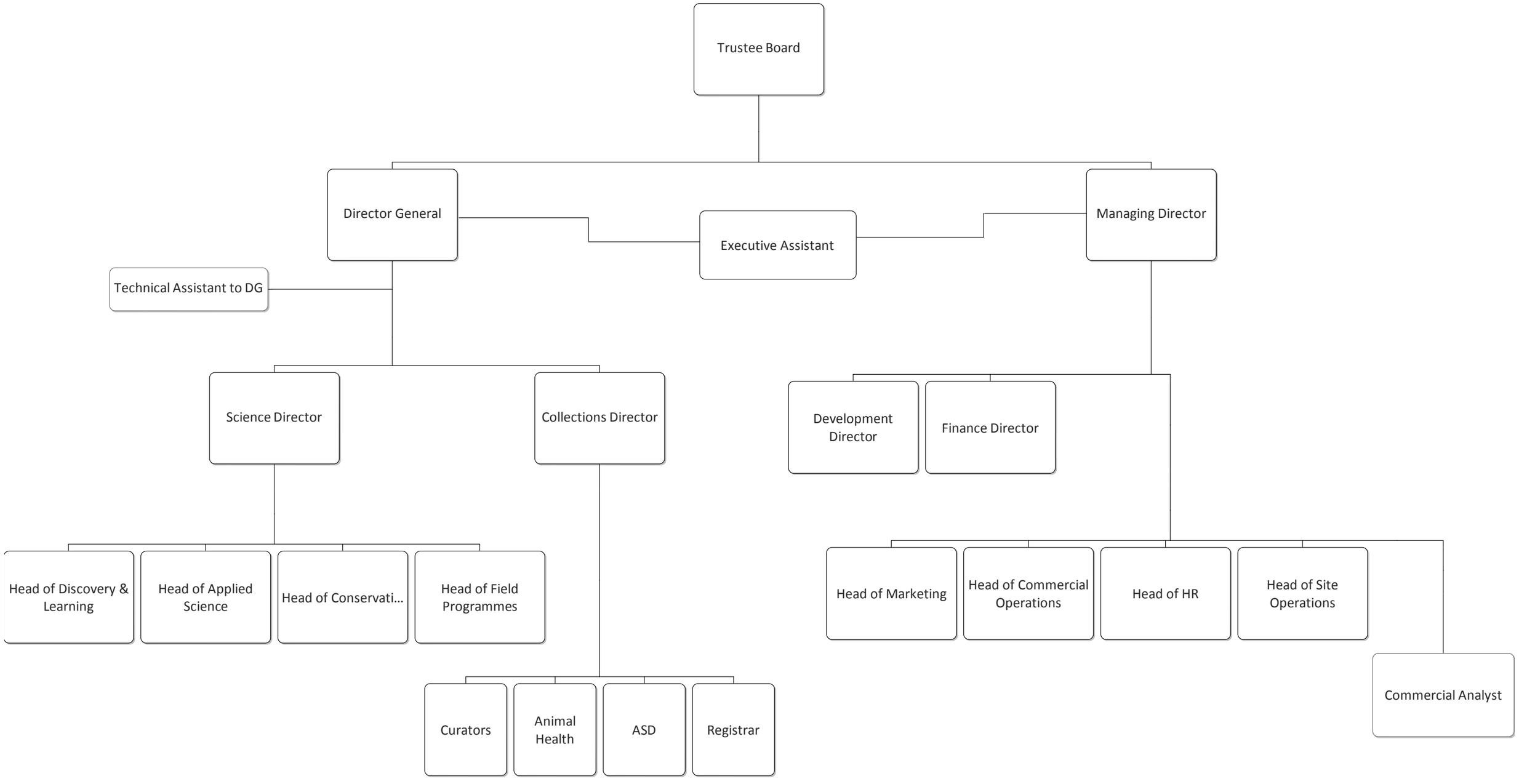
www.chesterzoo.org

Registered Charity Number 306077
Registered Company Number 287902

North of England Zoological Society
Caughall Road
Upton by Chester
Chester CH2 1LH
Tel: 01244 380280
Fax: 01244 371273
Email: info@chesterzoo.org

NEZS/Chester Zoo

ORGANISATION MANAGEMENT STRUCTURE 2016



REPTILES STOCKLIST (page 1 of 2)

		Stock 31/12/15			Acquisitions			Births			Deaths			Dispositions			Stock 31/12/16		
Preferred Scientific Name	**Common Name**	**M**	**F**	**U**	**M**	**F**	**U**	**M**	**F**	**U**	**M**	**F**	**U**	**M**	**F**	**U**	**M**	**F**	**U**
Batagur borneoensis	Malaysian painted river terrapin	0	2	2	1	0	0	0	0	0	0	0	0	0	0	0	1	2	2
Cuora galbinifrons	Flower-backed Box turtle	1	2	4	0	0	0	0	0	0	0	0	0	0	0	0	1	2	4
Cuora trifasciata	Chinese three-striped box turtle	1	2	5	0	0	0	0	0	1	0	0	0	0	0	0	1	2	6
Cuora zhoui	Zhou's box turtle	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	1	2	0
Geoclemys hamiltonii	Spotted pond turtle	0	0	4	0	0	0	0	0	0	0	0	1	0	0	0	0	0	3
Geoemyda spengleri	Black-breasted leaf turtle	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	0
Heosemys grandis	Giant Asian pond turtle	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	1	2	0
Heosemys spinosa	Spiny hill turtle	2	4	4	0	0	0	0	0	0	0	0	0	0	0	0	2	4	4
Mauremys annamensis	Annam leaf turtle	10	6	10	0	0	0	0	0	0	0	0	1	7	3	9	3	3	0
Orlitia borneensis	Malaysian giant pond turtle	2	0	0	0	5	0	0	0	0	0	0	0	1	0	0	1	5	0
Astrochelys radiata	Radiated tortoise	5	7	2	0	0	0	0	0	0	0	0	0	0	0	0	5	7	2
Astrochelys yniphora	Ploughshare tortoise	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
Chelonoidis nigra	Galapagos tortoise	1	3	0	0	0	0	0	0	0	1	0	0	0	0	0	0	3	0
Manouria emys emys	Asian brown tortoise	0	5	2	0	0	0	0	0	0	0	0	0	0	0	0	0	5	2
Chelodina mccordi	McCord's snake-necked turtle	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0
Podocnemis unifilis	Yellow-spotted Amazon River turtle	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0
Sphenodon punctatus	Tuatara	1	5	1	0	0	0	0	0	6	0	0	0	0	0	0	1	5	7
Acanthosaura capra *	Mountain Horned Lizard	4	9	4	0	0	0	0	0	30	1	2	13	0	3	0	4	7	17
Bronchocela cristatella *	Green Crested Lizard	2	2	35	0	0	0	0	0	11	1	0	10	0	0	17	1	2	20
Gonocephalus bellii	Bell's angle-headed dragon	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Gonocephalus chamaeleontinus *	Chameleon forest dragon	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1
Hypsilurus magnus *	Arboreal agamid lizard	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	0
Physignathus cocincinus	Asian water dragon	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Calumma parsonii	Parson's chameleon	1	1	0	0	1	0	0	0	0	0	1	0	0	0	0	1	1	0
Furcifer pardalis	Reunion chameleon	0	6	0	0	0	0	0	0	0	0	1	0	0	0	0	0	5	0
Anolis grahami	Jamaican anole	16	10	0	0	0	0	0	0	13	4	4	6	3	2	0	9	4	7
Anolis leachii *	Antigua anole	5	0	6	0	0	0	0	0	17	1	0	7	2	0	3	5	3	7
Anolis roquet summus *	Martinique Anole	2	3	1	0	0	0	0	0	19	0	1	5	3	6	3	1	0	6
Laemanctus serratus *	Casque-headed iguana	2	5	2	0	0	0	0	0	10	1	4	8	0	0	0	2	1	3
Oplurus cuvieri cuvieri	Cuvier's Madagascar swift	1	1	4	0	0	0	0	0	0	0	0	1	0	0	0	1	1	3
Dracaena guianensis	Caiman lizard	1	2	1	0	0	0	0	0	0	0	0	1	0	0	0	1	2	0
Lacerta agilis *	Sand lizard	10	3	0	0	0	0	0	0	6	1	0	1	0	0	0	9	3	5
Takydromus sexlineatus *	Six-lined grass lizard	0	0	76	0	0	0	0	0	7	0	1	28	0	0	0	14	27	8
Dasia olivacea *	Olive tree skink	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Lamprolepis smaragdina *	Philippine tree skink	0	0	7	0	0	0	0	0	16	0	0	2	0	0	0	3	2	16
Plestiodon longirostris	Bermuda skink	6	6	0	0	0	0	0	0	0	1	0	0	0	0	0	5	6	0
Eutropis macularia *	Orange-throated skink	0	0	3	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0
Eutropis multifasciata *	Oriental brown-sided skink	1	5	16	0	0	0	0	0	3	0	5	11	0	0	0	1	4	4
Shinisaurus crocodilurus	Chinese crocodile lizard	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	4
Varanus komodoensis	Komodo Dragon	1	5	0	0	0	0	0	0	0	0	0	0	0	1	0	1	4	0
Varanus prasinus	Emerald monitor	1	1	0	2	0	0	0	0	0	1	0	0	0	0	0	2	1	0
Varanus salvadorii	Crocodile monitor	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Broghammerus reticulatus	Reticulated python	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0

REPTILES STOCKLIST (page 2 of 2)

Morelia boeleni	Boelen's python	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0
Corallus caninus	Emerald tree boa	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Corallus cookii	Cook's tree boa	0	2	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0
Boiga dendrophila	Mangrove snake	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Erpeton tentaculatum *	Tentacled snake	1	5	8	1	0	7	0	0	0	0	0	1	1	0	0	1	5	14
Gonyosoma oxycephala	Red-tailed ratsnake	1	1	0	0	0	0	0	0	3	0	0	0	0	0	0	1	1	3
Orthriophis moellendorffi	Flower snake	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
Thamnophis sirtalis tetrataenia	San Francisco gartersnake	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Bothriechis schlegelii *	Eyelash Viper	4	2	3	0	0	0	0	0	0	0	0	0	4	0	3	0	2	0
Cryptelytrops albolabris	White-lipped Viper	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Cryptelytrops venustus *	Beautiful pitviper	1	4	8	0	0	0	0	0	27	0	0	28	0	0	0	1	4	7
Bitis gabonica rhinoceros	West African gaboon viper	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
Caiman crocodilus	Spectacled caiman	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Tomistoma schlegelii	False gharial	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
		109	136	213	5	8	11	0	0	169	12	19	124	21	18	36	106	152	159
		458			**24**			**169**			**155**			**75**			**417**		

** denotes managed in groups*

ZOO RESEARCH AND SCIENTIFIC PUBLICATIONS

Peer-reviewed publications

Baines, F., Chattell, J., Dale, J., Garrick, D., Gill, I., Goetz, M., Skelton, T. & **Swatman, M.** (2016). How much UV-B does my reptile need? The UV-Tool, a guide to the selection of UV lighting for reptiles and amphibians in captivity. *Journal of Zoo and Aquarium Research,* 4**,** 42.

Edwards, K. L., Trotter, J., Jones, M., Brown, J. L., Steinmetz, H. W., & **Walker, S. L.** (2016). Investigating temporary acyclicity in a captive group of Asian elephants (*Elephas maximus*): Relationship between management, adrenal activity and social factors. *General and comparative endocrinology*, *225*, 104-116.

Esson, M. & **Moss, A.** (2016). The challenges of evaluating conservation education across cultures. *International Zoo Yearbook,* 50**,** 61-67.

Fu, Y., Chen, B., **Dowell, S.** D. & Zhang, Z. (2016). Nest predators, nest-site selection and nest success of the Emei Shan Liocichla (*Liocichla omeiensis*), a vulnerable babbler endemic to southwestern China. *Avian Research,* 7**,** 18.

Hosey, G., Melfi, V., Formella, I., Ward, S. J., Tokarski, M., Brunger, D. & **Hill, S. P.** (2016). Is wounding aggression in zoo-housed chimpanzees and ring-tailed lemurs related to zoo visitor numbers?. *Zoo biology*, 35 (3), 205-209

Hudson, M. A., Young, R. P., D'urban Jackson, J. D., Orozco-Terwengel, P., Martin, L., James, A., Sulton, M., **Garcia, G.**, Griffiths, R. A., Thomas, R., Magin, C., Bruford, M. W. & Cunningham, A. A. (2016). Dynamics and genetics of a disease-driven species decline to near extinction: lessons for conservation. *Nature Scientific Reports,* 6**,** 30772.

Hudson, M. A., Young, R. P., **Lopez, J.,** Martin, L., Fenton, C., Mccrea, R., Griffiths, R. A., Adams, S., Gray, G. & **Garcia, G.** (2016). In-situ itraconazole treatment improves survival rate during an amphibian chytridiomycosis epidemic. *Biological Conservation,* 195**,** 37-45.

Inskip, C., Carter, N., Riley, S., Roberts, T., & MacMillan, D. (2016). Toward Human-Carnivore Coexistence: Understanding Tolerance for Tigers in Bangladesh. *PloS one*, *11*(1), e0145913.

Lea, J. M., Kerley, G. I., Hrabar, H., Barry, T. J., & Shultz, S. (2016). Recognition and management of ecological refugees: A case study of the Cape mountain zebra. *Biological Conservation*, *203*, 207-215.

Lopez, J., Barbon, A. R., Smithyman, J., Goetz, M., Marschang, R. E., Dastjerdi, A. & Stidworthy, M. F. (2016). High prevalence of intestinal adenocarcinoma in a captive populatio of Amazon milk frog (*Trachycephalus resinifictrix*). *Journal of Zoo and Wildlife Medicine,* 47**,** 1061-1068.

Moss, A. (2016). Can conservation education learn anything from 'Big Data'? *International Zoo Yearbook,* 50**,** 23-33.

Plumptre, A. J., **Nixon, S.**, Kujirakwinja, D. K., Vieilledent, G., Critchlow, R., Williamson, E. A., Nishuli, R., Kirkby, A. E. & Hall, J. S. (2016). Catastrophic Decline of World's Largest Primate: 80% Loss of Grauer's Gorilla (*Gorilla beringei graueri*) Population Justifies Critically Endangered Status. *PLoS ONE,* 11**,** e0162697.

Plumptre, A., & **Nixon, S**. (2016). New survey reveals dramatic decline of Grauer's gorilla. *Oryx*, *50*(2), 203.

Rademaker, R., Meijaard, E., Semiadi, G., Blokland, S., Neilson, E. W. & **Rode-Margono, E. J.** (2016). First Ecological Study of the Bawean Warty Pig (*Sus blouchi*), One of the Rarest Pigs on Earth. *PLoS ONE,* 11**,** e0151732.

Sauer, C., Hammer, C., Bertelsen, M. F., Tuken, T., Clauss, M. & Hammer, S. (2016). Quantitative macroscopic digestive tract anatomy of the beira (*Dorcatragus megalotis*). *Journal of Zoo and Aquarium Research,* 4**,** 174-179.

Schuiteman, A., **Ryan, C.**, Nut, M., Nay, S. & Att, S. (2016). New records of Orchidaceae from Cambodia II. *Cambodian Journal of Natural History,* 2016**,** 7-14.

Wong, E. P., Yon, L., **Purcell, R.**, **Walker, S. L.**, Othman, N., Saaban, S. & Campos-Arceiz, A. (2016). Concentrations of faecal glucocorticoid metabolites in Asian elephant's dung are stable for up to 8 h in a tropical environment. *Conservation Physiology,* 4.

Yarnell, K., **Purcell, R. S.** & **Walker, S. L.** (2016). Fecal Glucocorticoid Analysis: Non-invasive Adrenal Monitoring in Equids. *Journal of Vizualised Experiments,* 110**.**

Conference Presentations

Ashpole, I. A. (2016). The successful treatment of a giant anteater with clinical orthopoxvirus ('cowpox') infection [Oral Presentation]. *British Veterinary Zoological Society, 11-13 March.* Chester.

Ashpole, I. A. (2016). The successful treatment of a giant anteater with clinical orthopoxvirus ('cowpox') infection [Oral Presentation]. *BIAZA Pangolin, Aardvark and Xenarthra working group conference, 11 September.* ZSL London Zoo.

Barton, C. (2016). Influencing the palm oil sector through collaborations and effective partnerships [Oral Presentation]. *EAZA Conservation Forum, 9-13 May.* Fuengirola, Spain.

Barton, C. (2016). Palm oil use in cosmetics: Sustainable palm oil from a conservationists perspective [Oral Presentation]. *Society for Cosmetic Scientists, 15 November.* Coventry, UK.

Bazley, S. (2016). Investigating the impact of interactive touch tables on visitors at Chester Zoo [Oral Presentation]. *23rd Biennial Conference of International Zoo Educators Association, 18-22 October.* Buenos Aires, Argentina.

Biddle, R. & **Pilgrim, M.** (2016). Blue-throated Macaw, *Ara glaucocularis*, EEP Update for Annual TAG Meeting [Oral Presentation]. *EAZA Annual Conference, 20-24 September.* Belfast, Northern Ireland.

Biddle, R. & **Pilgrim, M.** (2016). Eastern Black rhino EEP Update for annual TAG & EEP meetings [Oral Presentation]. *EAZA Annual Conference 20-24 September.* Belfast, Northern Ireland.

Biddle, R. & **Pilgrim, M.** (2016). Ecuador Amazon Parrot, *Amazona lilacina*, EEP Update for Annual TAG Meeting [Oral Presentation]. *EAZA Annual Conference, 20-24 September.* Belfast, Northern Ireland.

Biddle, R. & **Pilgrim, M.** (2016). Fighting for survival: Conserving the Ecuador Amazon parrot (*Amazona lilacina*) [Poster Presentation]. *EAZA Annual Conference, 20-24 September.* Belfast, Northern Ireland.

Biddle, R. & **Pilgrim, M.** (2016). Fighting for survival: Conserving the Ecuador Amazon parrot (*Amazona lilacina*) [Poster Presentation]. *International Conservation and Commercial Breeding Symposium, 8-9 March 2016.* Chester.

Biddle, R. & **Pilgrim, M.** (2016). Jaguar, *Panthera onca*, EEP Update for Annual EEP & TAG Meetings [Oral Presentation]. *EAZA Annual Conference, 20-24 September.* Belfast, Northern Ireland.

Cowl, V. (2016)a. Contraception in prosimians - Prosimian TAG [Oral Presentation]. *EAZA Annual Conference, 20-24 September.* Belfast, Northern Ireland.

Cowl, V. (2016). Contraceptive research in callitrichids - Callitrichid TAG [Oral Presentation]. *EAZA Annual Conference, 20-24 September.* Belfast, Northern Ireland.

Cowl, V. (2016). EGZAC EAZA update 2016 - veterinary committee [Oral Presntation]. *EAZA Annual Conference, 20-24 September* Belfast, Northern Ireland.

Cowl, V. (2016). EGZAC: The use of contraception in wildlife management [Workshop]. *EAZA Annual Conference, 20-24 September.* Belfast, Northern Ireland.

Cowl, V. (2016). Reproductive management in EAZA breeding programmes - EPMAG committee [Oral Presentation]. *EAZA Annual Conference, 20-24 September 2016.* Belfast, Northern Ireland.

Cowl, V. (2016). Reproductive management in EAZA zoos - Joint TAG/EEP/ESB coordinators meeting [Oral Presentation]. *EAZA Annual Conference, 20-24 September.* Belfast, Northern Ireland.

Cunningham, E., **Unwin, S.** & Setchell, J. M. (2016). Can we make wild primate capture safer? [Oral Presentation]. *Joint meeting of the International Primatological Society and the American Society of Primatologists, 21-27 August.* Chicago, Illinois.

Cunningham, E., **Unwin, S.** & Setchell, J. M. (2016). Improving the way we Dart: reviewing trends in darting wild primates [Poster Presentation]. *Joint AAZV/ EAZWV/ IZW Conference, 18-22 July.* Atlanta, Georgia.

Davis, N. (2016). Promoting natural behvaiours at Chester Zoo- everyone's a winner! [Oral Presentation]. *Learning from the Wild, 23-24 April.* Chester Zoo.

Evans, G. (2016). Ecuador Amazon – Ecology, conservation, captive management and breeding [Oral Presentation]. *BIAZA Bird Working Group, 26-27 October.* Chester Zoo.

Evision, E. (2016). Sleeping behaviour in Asian elephants [Oral Presentation]. *15th International Elephant & Rhino Conservation and Research Symposium, 14-18 November.* Singapore Zoo.

Finch, K., Parry, C., Lenihan, A., Davis, N., Rowlands, T. & **Holmes, L.** (2016). Ready for an Island life? Assessing the impact of moving Sumatran orangutans (*Pongo abelli*) [Oral Presentation]. *18th BIAZA Research Conference, 28-29 June.* Yorkshire Wildlife Park, Doncaster.

Flewitt, A., Holmes, L., Garcia, G., Baker, B., Boyle, R., Cook, M. & **Fidgett, A. F.** (2016). Establishing a standardised method of measuring Komodo dragon (*Varanus komodoensis*) body temperature [Oral presentation by LH]. *18th BIAZA Research Conference, 28-29 June.* Yorkshire Wildlife Park, Doncaster.

Garcia, G. (2016). Research at Chester Zoo - building bridges in conservation and animal welfare [Oral Presntation]. *BIAZA Reptile and Amphibian Working Group Meeting 11th-13 April 2016*, Crocodiles of the World, Oxford.

Gray, H. (2016). Husbandry and Breeding of Naked Mole Rates (Heterocephalus glaber) at Chester Zoo [Poster Presentation]. *BIAZA Mammal Working Group Conference, 7-10 September.* Woburn Safari Park.

Holmes, L. & **Moss, A.** (2016). Multi-disciplinary evaluation techniques to assess the impact of new exhibits on captive animal welfare [Poster presentation]. *EAZA Annual Conference, 20-24 Septmeber 2016.* Belfast.

Holmes, L. & **Moss, A.** (2016). Multi-disciplinary evaluation techniques to assess the impact of new exhibits on captive animal welfare [Poster Presentation]. *UFAW Recent Advances in Animal Welfare Science V, 23 June 2016.* York.

Holmes, L., Sweetman, Z. & **Finch, K.** (2016). Endocrine analysis of the Soutern cassowary [Oral Presentation]. *BIAZA Bird Working Group, 26-27 October.* Chester Zoo.

Holmes, L. & **White, D.** (2016). A tale of two-toed sloths [Poster Presentation]. *First International Xenarthran Conference, 10-11 September 2016.* ZSL.

Hough, L. (2016). Northern Bald Ibis – Captive management and conservation initiatives [Oral Presentation]. *BIAZA Bird Working Group, 26-27 October.* Chester Zoo.

Howe, F. (2016). The management of Okapi at Chester Zoo with a focus on breeding management and the 2015 international okapi move [Oral Presentation]. *International Graffid Conference, 9-12 May 2016.* Brookfield Zoo, Chicago.

Keates, K., Biddle, R., Pilgrim, M. & **Fidgett, A. F.** (2016). Evaluating the diets of captive black rhinos in European zoos, with particular emphasis on iron content [Oral Presentation]. *18th BIAZA Research Conference, 28-29 June.* Yorkshire Wildlife Park, Doncaster.

Lopez, J. (2016). Eastern black rhino (*Diceros bicornis michaeli*) post mortem results [Oral presentation]. *EAZA Annual Conference, 20-24 September.* Belfast, Northern Ireland.

Lopez, J. (2016). Mountain Chicken frog (*Leptodactylus fallax*) health [Oral Presentation]. *EAZA Annual Conference, 20-24 September.* Belfast, Northern Ireland.

Matthews, N., Bird, S. & Harris, E. W**.** (2016). Is there anybody home? Developing a new dormouse detection technique [Poster Presentation]. *PTES National Dormouse Conference, 9-10 September.* Reading.

Monne Rodriquez, J. M., Chantrey, J., **Unwin, S.** & Verin, R. 2016. Cardiac truncus arteriosus in an eastern black rhinoceros (*Diceros bicornis michaeli*) [Poster Presentation]. *Joint European Congress of the ECVP and ESVP, 7-10 September.* Bologna, Italy.

Moon, A. (2016). Evaluation of the Safari Ranger service offered by Chester Zoo [Oral Presentation]. *BIAZA Education and Presenters Conference, 9-11 November.* Blackpool Zoo.

Moss, A. (2016). Evaluating the things that zoos do: Lessons learnt from conservation education research at Chester Zoo [Oral Presentation]. *Behaviour change networking conference, 21 April.* Bristol Zoo.

ZOO RESEARCH AND SCIENTIFIC PUBLICATIONS

Moss, A. (2016). How does visitor research influence decisions and contribute to effective change? [Panel discussion]. *Visitor Studies Group Conference, 16-18 March.* London.

Moss, A. (2016). The human value of the zoo: What do people get from being close to zoo animals? [Oral presentation]. *Persons as Animals Conference, 6-9 July 2016.* University of Leeds.

Moss, A. & Murray, C. (2016). Social survey design workshop [Workshop]. *BIAZA Research Conference, 28-29 June.* Yorkshire Wildlife Park.

Nixon, S., Plumptre, A. J., Veilledent, G., Critchlow, R., Nishuli, R., Kirkby, A., Williamson, E., Hall, J. & Kujirakwinja, D. (2016). Conservation status of Grauer's gorilla (*Gorilla beringei graueri*) and Eastern Chimpanzees (*Pan troglodytes schweinfurthii*) in Eastern Democrativ Republic of Congo [Oral Presentation]. *Joint meeting of the International Primatological Society and the American Society of Primatologists, 21-22 August 2016.* Chicago, USA.

Owen, A. (2016). Asian Songbird crisis– Conservation alert [Oral Presentation]. *BIAZA Bird Working Group, 26-27 October.* Chester Zoo.

Pilgrim, M. (2016). Islands [Oral Presentation]. *WAZA Annual Conference, 9-13 October.* Pubela, Mexico.

Pilgrim, M. (2016b) No man is an Island [Oral Presentation]. *EAZA Annual Conference, 20-24 September.* Belfast, Northern Ireland.

Rafferty, N., Nager, R., Bertelsen, M. F. & **Walker, S.** (2016). Asian elephant bonds: How do herd mates physiologically respond when there is a birth within the group? [Poster presentation]. *EAZA Annual Conference, 20-24 September 2016.* Belfast.

Rafferty, N., Nager, R., Bertelsen, M. F. & **Walker, S. L.** (2016). Asian elephant bonds: How do herd mates physiologically respond when there is a birth within the group? [Poster Presentation]. *18th BIAZA Research Conference, 28-29 June.* Yorkshire Wildlife Park, Doncaster.

Rode-Margono, E. J. & Burton, J. (2016). GSMP developments: Zoo education, in-situ activities (in Pig and Peccary TAG) [Oral Presentation]. *EAZA Annual Conference, 20-24 September 2016.* Belfast, Northern Ireland.

Rode-Margono, E. J. & Burton, J. (2016). GSMP developments: Zoo survey, zoo education, in-situ activities (in Action Indonesia meeting) [Oral Presentation]. *EAZA Annual Conference, 20- 24 September.* Belfast, Northern Ireland.

Rode-Margono, E. J. & Rademaker, M. (2016). First study on the Endangered Bawean warty pig (*Sus blouchi*): population size, ecology, behaviour and conservation [Oral Presentation]. *11th symposium on wild boar and other suids, 5-7 September 2016.* Mersch, Luxembourg.

Rode-Margono, E. J. & Rademaker, M. (2016). First study on the Endangered Bawean warty pig: population size, ecology, behaviour and conservation (in Pig and Peccaries TAG) [Oral Presentation]. *EAZA Annual Conference, 20-24 September.* Belfast, Northern Ireland.

Rode-Margono, E. J. & Rademaker, M. (2016). On the brink of extinction? Population status, behaviour and conservation of Bawean deer (*Axis kuhlii*) (in Deer TAG) [Oral Presentation]. *EAZA Annual Conference, 20-24 September.* Belfast, Northern Ireland.

Sauer, C. (2016). Why do birds eat..? An overview of avian digestive systems [Oral Presentation]. *BIAZA Bird Working Group, 26-27 October.* Chester Zoo.

Sherman, J., **Unwin, S.**, Lucas, D., **Farmer, K.** & Williamson, E. (2016). Improving Wildlife and Habitat Conservation: Using monitoring, evaluation and adaptive management to measure and improve conservation success [Poster Presentation]. *IUCN World Conservation Congress, 21-27 August.* Hawaii.

Simpson, A. W. J., Fidgett, A. L., Roffe, S., Rowlands, T. & **Williams, L. J.** (2016). Begging for the hand that feeds you - Investigating the effects of keeper presence on begging behaviour in captive Asian short clawed otters (*Aonyx cinereus*) [Poster Presentation]. *18th BIAZA Research Conference, 28-29 June.* Yorkshire Wildlife Park, Doncaster.

Smith, C. (2016). Using game play to take our audiences inside the system [Oral Presentation]. *23rd Biennial Conference of International Zoo Educators Association, 18-22 October.* Buenos Aires, Argentina.

Thomas, H. (2016). Green around the gills: using plastic elastomers to aid fish identification [Oral Presentation]. *National Aquarium Conferece, 18-19 November.* Oceanarium, Bournemouth.

Turner, C., Moss, A., White, D., Andrewes, J., Rowlands, T. & **Holmes, L.** (2016). Behaviour of Slender-tailed meerkats (*Suricata suricatta*) and Cape porcupines (*Hystrix africaeaustralis*) in a mixed species exhibit [Poster Presentation]. *18th BIAZA Research Conference, 28-29 June.* Yorkshire Wildlife Park, Doncaster.

Unwin, S. (2016). How best to decide where and when to intervene: Does effective disease prevention require a culture change within the UK zoo system? [Oral Presentation]. *2016 Spring Conference of the BVZS, 11-13 March*, Chester, UK.

Unwin, S., Sulistyo, F., Commitante, R., Jaya, R., Jaya, Y. & Nente, C. (2016). OVAG – The Orangutan Veterinary Advisory Group: one health solutions in orangutan conservation medicine through empowerment of those working in the front line [Keynote Presentation]. *18th BIAZA Research Conference, 28-29 June.* Yorkshire Wildlife Park, Doncaster.

Van Zijll Langhout, M., Lane, E., **Unwin, S**. & Michel, A. L. (2016). Tuberculosis in a closed population of vervet monkeys (Chlorocebus pygerythus): Immunodiagnostics and Pathology [Oral Presentation]. *Joint AAZV/ EAZWV/ IZW Conference, 18-22 July.* Atlanta, Georgia.

Walker, S. L. (2016). How can we use science to be more effective in conservation breeding and improve the conservation status of wildlife? [Oral Presentation]. *EuroScience Open Forum 24 - 27 July 2016.* Manchester.

Walker, S. L. (2016). Understanding and influencing population sustainability of Eastern black rhinos *Diceros bicornis michaeli* [Oral Presentation]. *International Conservation and Commercial Breeding Symposium, 8-9 March 2016.* Chester.

Watson, P. (2016). Breeding management of the short-eared sengi at Chester Zoo [Oral Presentation]. *BIAZA Mammal Working Group Conference.* Woburn Safari Park, UK.

White, D. (2016). Rodrigues fruit bat species update [Oral Presentation]. *EAZA small mammal midyear TAG, 18-20 May.* Jihlava, Czech Republic.

Wicks, K. (2016). Uncovering night time behaviour to highlight the enrichment needs of Nocturnal and Crepuscular Animals in captivity. [Oral Presentation] *Regional Environmental Enrichment Conference 22-25 May 2016.* Fota Wildlife Park, Cork, Ireland.

Wilson, S. (2016). Assam: When connectivity runs out [Oral Presentation]. *Join the Dots: Chester Zoo annual conservation symposium.* Chester, UK.

Zimmermann, A. (2016). Best Practices in Human-Wildlife Conflict Management [Oral Presentaiton]. *IUCN World Conservation Congress, 9 September.* Honolulu, USA.

Zimmermann, A. (2016). Human-elephant conflict & human dimensions [Oral Presentation]. *IUCN SSC Asian Elephant Specialist Group, 12 November* Guwahati, Assam, India.

Zimmermann, A. (2016). The human dimensions of conflict: Insights from social sciences to help manage HEC [Oral Presentation]. *IUCN SSC HWC Task Force & Asian Elephant Specialist Group, 9 November.* Guwahati, Assam, India.

Zimmermann, A. (2016). Introduction: Workshop on Human-Elephant Conflict in Asia [Oral Presentation]. *IUCN SSC HWC Task Force & Asian Elephant Specialist Group, 9 November* Guwahati Assam India.

Zimmermann, A. (2016). IUCN SSC HWC Task Force: aims, objectives, strategy [Oral Presentation]. *IUCN SSC HWC Task Force Annual Meeting, 27 June.* Oxford, UK.

Reports and non-peer reviewed publications

Biddle, R. & **Pilgrim, M.** (2016). Blue-throated Macaw Annual Studbook Report (*Ara glaucogularis*).

Biddle, R. & **Pilgrim, M.** (2016). Eastern Black Rhino Annual Studbook Report (*Diceros bicornis micaheli*).

Biddle, R. & **Pilgrim, M.** (2016). Ecuador Amazon Parrot (*Amazona lilacina*) EAZA Best Practice Guidelines. Chester Zoo.

Biddle, R. & **Pilgrim, M.** (2016). Ecuador Amazon Parrot (*Amazona lilacina*) EAZA Best Practice Guidelines.

Biddle, R. & **Pilgrim, M.** (2016). Ecuador Amazon Parrot Annual Studbook Report (*Amazona lilacina*).

Biddle, R. & **Pilgrim, M.** (2016). Jaguar Annual Studbook Report (*Panthera onca*).

Drake, G. J., Bechstein, N. & Kolter, L. 2016. Bear Facts Of Hair Loss. *Zooquaria.*

Duckworth, J. W., Shepher, C., **Rode-Margono, E. J.**, Wilianto, E., Spann, D. & Abramov, A. V. (2016). *Melogale orientalis*. The IUCN Red List of Threatened Species 2016.

Fu, Y., Dai, B., Benping, C., **Dowell, S**. & Zhang, Z. (2016). Breeding ecology of the globally endangred Sichuan partridge (*Arborophila rufipectus*). *G@llinformed: Newsletter of the Galliformes Specialist Group.*

Garcia, G. & Schad, K. 2016. Long-term Management Plant for the Mountain Chicken Frog (*Leptodactylus fallax*) European Studbook (ESB). Chester Zoo & EAZA.

Khwaja, H. (2016). Flutter Black- The return of the large heath butterfly. *EAZA Conservation Database Snapshots - eNews.*

Plumptre, A. J., **Nixon, S.**, Critchlow, R., Vieilledent, G., Nishuli, R., Kirkby, A., Williamson, E. A., Hall, J. S. & Kujirakwinja, D. (2016). Staus of the Grauer's gorilla and chimpanzees in Eastern Democratic Republic of Congo: Historical and current distribution and abundance. *Unpublished report to Arcus foundation, USAID and US Fish and Wildlife Service.*

Rode-Margono, E. J. (2016). Wild boar on the rise! 11th International Symposium on Wild Boar and other Suids. Suiform Soundings: Newsletter of the IUCN/SSC Wild Pig, Peccary and Hippo Specialist Groups.

Rode-Margono, E. J., Diana, P., Zahra, S., Istiqomah, D. R., Lutfi, R. D., Leo, S., Ansari, S. D., Rademaker, M. & Semiadi, G. (2016). Direct observations on the behaviour and group patterns of Bawean warty pigs (*Sus blouchi*) on Bawean island, Indonesia. Suiform Soundings: Newsletter of the IUCN/SSC Wild Pig, Peccary and Hippo Specialst Groups.

Walker, S. L., Forsyth, S., Feltrer, Y., **Cowl, V.** & Schad, K. (2016). Population Managment: Managing the Numbers. ZooQuaria: EAZA.

Watson, P. (2016). Breeding Management of the short eared sengi at Chester Zoo. *Ratel,* 43**,** 8-10.

White, D. (2016). Rodrigues fruitbat EEP Annual Report 2015.

NEZS/Chester Zoo

ORGANISATION MANAGEMENT STRUCTURE 2016

MARK PILGRIM BSc (Hons), PhD
Chief Executive Officer

Mark left school in 1980 and found engineering work in Portsmouth Dockyard. He decided to go back to further his education at the North East London Polytechnic, graduated with a degree in Science in 1986 and joined the zoo as a bird keeper two years later. Mark went on to become Deputy Curator of Birds and, in 2001, became Chief Curator responsible for the whole animal and plant collection at the zoo. In 2007 Mark became Director of Conservation and Education with a determination to bring these two key areas of the zoo closer. Mark is the Vice Chairman of the European Association of Zoos and Aquariums (EAZA) and the chair of the EAZA Technical Assistance committee, and a Council member of the British and Irish Association of Zoos and Aquariums (BIAZA). He manages the European zoo populations of Black rhino, and the Ecuadorian Amazon parrot. In September 2010, Mark was appointed as the new Director General of the Society, only the fourth in its history.

JAMIE CHRISTON BA (Hons)
Chief Operating Officer

After graduating from Leicester University with a degree in politics, Jamie spent his first ten years working in core high street food and department store management with various management roles initially in the North West and then across the rest of the UK. In 2003, as UK regional airport dynamics changed, Jamie joined Manchester Airport Group, heading up commercial operations at East Midlands, Humberside and Bournemouth Airports. In 2007, he continued his career as Commercial Director and then latterly Managing Director of Exeter Airport in the South West where he managed the transition from local authority to private sector ownership. During that period, Jamie managed masterplanning, site development and helped improve commercial profitability. Latterly, Jamie was responsible for group on-board operations for Stena Line, one of Europe's leading ferry operators during a period of rapid expansion and change. Jamie joined the Society in July 2013 and has developed the Mission Enabling team helping to deliver record levels of operating surplus which as funded much of the zoo's recent development.

SIMON DOWELL
Science Director

Simon graduated from the University of Exeter in 1986 with a degree in Biological Sciences and went on to do his DPhil in Zoology at the University of Oxford which he completed in 1990. Simon's DPhil research on game bird behaviour was carried out at the Game and Wildlife Conservation Trust and he continued to work for them as a Research Biologist until 1992. He then moved on to a lectureship in Conservation Ecology at Liverpool John Moores University where he developed their BSc degree in Wildlife Conservation as well as conducting research on bird conservation, before leading their Department of Biological and Earth Sciences as Director for six years. In 2013 Simon moved to Oxford Brookes University where he was Associate Dean (Strategy & Development) for their Faculty of Health and Life Sciences until joining the Zoo as Science Director in 2016. Simon has had a long association with Chester Zoo having coordinated projects in Sichuan as part of the Zoo's conservation outreach activities in China since 2002 and he served as a trustee of NEZS and Chair of the Conservation and Education Committee between 2009 and 2015. He also served as a Council Member and Chair of the Conservation Committee for the Cheshire Wildlife Trust between 2004 and 2008. Simon is currently a Visiting Professor at the University of Chester, a Fellow of the Royal Society of Biology and Co-Chair of the IUCN SSC Galliformes Specialist Group.

SIMON MANN BSc
Development Director (until October 2016)

Simon initially studied as an architect before completing a degree in construction management. After qualifying he worked for a number of regional and national building contractors as a design and build manager on projects across the UK. In 1997 Simon moved to project management consultancy, initially working for a specialist London based practice on a series of high profile projects including the BBC Broadcasting House re-development in Central London. In 2003 he joined the largest UK PM consultancy and as a Director helped to develop the regional business within the North West. Simon first worked for the Society as Interim Development Director for Natural Vision in 2008 before taking up the permanent role in March 2009.

ELIZABETH CARNIE, BSc (Hons), FCA
Finance Director

After graduating from Durham University with a degree in Mathematics, Liz joined PricewaterhouseCoopers LLP in Liverpool and qualified as a Chartered Accountant in 2000. Liz worked for PwC Audit & Assurance for 10 years, working with a number of North West PLCs on both statutory audits and corporate transactions. Liz also spent a year in PwC's London office working in the Accounting Technical department advising the practice and delivering training both internally and to external clients. Liz joined Styles & Wood Group PLC in 2007 as Group Financial Controller and worked with the business through a number of transactions including refinancing and equity fundraising. Liz joined the Society as Director of Finance in January 2014. Liz is a Board Member of the Chester Growth Partnership.

MIKE JORDAN
Collections Director

Mike trained as a zoologist at the University of London and after graduating served as an officer in the Royal Engineers and in the UK Fire and Rescue Service. Mike returned to zoology to complete his postgraduate studies working for the UK Forestry Commission doing research on woodland rodent ecology and conservation. It was around 1990 that Mike became involved in zoos through work with the IUCN, BIAZA and EAZA and went on to become a senior lecturer in zoo and wildlife management based at Sparsholt College in Hampshire. Mike worked extensively in reintroduction and conservation management & planning, specialising in small mammals and invertebrates and first joined the zoo 14 years ago as Curator of Mammals, Birds and Conservation Training. From 2009 – 2015 Mike worked as senior conservation advisor to the South African government in zoos and game reserves before returning to Chester Zoo in 2015 as the Director of Collections.

BRIEF BIOGRAPHIES OF THE COUNCIL OF TRUSTEES

Chairman

Mr Bruce Ursell

Had a career in the City of London eventually becoming CEO of two merchant banks and director of a FTSE 100 company. Chaired the management board of a top ten accounting firm. Commenced working life by spending five years in sub-Saharan Africa. From 1998 he spent 12 years as a non-executive director of the London arm of the largest bank in Africa and has more recently chaired entities managing private and European Government investments in emerging markets, particularly in Africa.

Vice Chairman

Mrs Rebecca Burke-Sharples CBE

Retired NHS Chief Executive. 32 years' experience in the NHS and was awarded the CBE in 2002 for services to nursing and health care management. Previously a member of the UK Council on Bio-ethics with a keen interest in the ethical treatment of animals. Prior to retirement in 2008 she was Chief Executive of a large NHS Primary Care Trust with a budget of over half a billion pounds. She has expertise in organisational development and continuous improvement initiatives. A Fellow of Liverpool John Moores University, and Non Executive Director of a leading NHS Foundation Trust. Married to Alan, a retired Finance Director, who is currently a Trustee of the NEZS Superannuation Fund Scheme and has previously served as NEZS Council Member; they have one daughter.

Vice Chairman

Mr William Beale MA (Cantab), MEng

Will is Head of Programme Operations, WWF-UK. After working for 10 years with Unilever as a Chartered Chemical Engineer in various innovation, development and manufacturing roles, Will joined World Wildlife Fund (WWF-UK) in 2003. His work focuses on developing the organisation, its processes and people, to achieve increased impact and value for money from conservation programmes overseas and in the UK. Will represents WWF on the Conservation Measures Partnership, a partnership of conservation organisations that seek better ways to design, manage, and measure the impacts of their conservation actions.

Trustees

Mr Malcolm Ardron BA Hons (Oxon), CEng FIMechE

Company Managing Director and Fellow of the Institution of Mechanical Engineers. After studying Engineering Science at Oxford University a career in both public and private sectors ranging from construction of nuclear power stations, road and rail projects, industrial and commercial buildings; consultant to nuclear and manufacturing sectors in UK and Europe on commercial dispute resolution including Expert Witness to Court (Technology & Construction Division). Currently Managing Director of a company providing engineering and construction services.

Prof Malcolm Bennett BVSc, PhD, MRCVS, FRCPath

Professor of Veterinary Pathology, University of Liverpool. Research and teaching interests are in 'One Health' approaches to infectious diseases, especially infections that might be zoonotic, emerging infectious diseases, and infectious diseases of wild animals in the context of ecosystem health and the interfaces between humans, domestic animals and biodiversity.

Mrs Catherine Buckley MA (Oxon), PGCE

Retired Headmistress of The Queen's School, Chester. After studying Modern Languages at Oxford, she spent two years teaching in Southern Germany. Has since taught for most of her career at leading independent schools in the North West. She retired after nine years as headmistress of The Queen's School in summer 2010. She is also a Vice Chair of Governors at Bolton School.

Prof Stefan Buczacki BSc, DPhil, Hon DUniv, CBiol, FSB, FIHort, FLS, ARPS

Biologist. Main areas of expertise horticulture, plant pathology, botany and natural history. Although graduating in Botany [Southampton] and Forestry [Oxford], his first love was Zoology, ignited by his childhood in a Derbyshire village. He spent many years in research before becoming a high profile gardening personality, appearing on TV and radio and in newspapers and magazines. He is Britain's most experienced gardening writer and broadcaster with credits including nearly 60 books, over 3000 articles and a radio and TV career stretching back nearly 30 years. In addition to his familiar popular role, he works as an expert witness and consultant with an international reputation and holds an Honorary Chair at Liverpool John Moores University. He is also now gaining a more unexpected reputation as a political biographer.

Mr Brian Child MIPA

Retired. Spent 25 years at McCann-Erickson Manchester and 10 of those as Chief Executive. During this time also held the role of UK Group Chairman and for the last two years held the role of European Vice President and Chief Executive of Momentum Europe. Now runs his own marketing company, specifically to help small/medium agencies to realise the full extent of their ambitions. Is a non-executive director of The Foundry, a group of marketing services suppliers based throughout the UK. Has a special interest in international zoo marketing.

Sandra Donnelly BSc, PGCE

Following a career in financial services, Sandra teaches Economics and Business Studies at the Fallibroome Academy and is also pursuing a MA in Education. Formerly the Chief Executive of the Economics, Business and Enterprise Association she was responsible for building relationships with a range of stakeholders including government bodies, academics and education professionals. She also has co-ordinated partnerships with schools in South Africa, China and Australia. A regular visitor of Chester Zoo since childhood, Sandra credits the zoo for inspiring a lifelong love of wildlife. She has travelled widely to experience wildlife habitats and has visited zoos and conservation projects across the world. Through these experiences and close links to Port Moresby Nature Park, in Papua New Guinea, she has gained a practical understanding of the challenges facing zoos and conservationists.

Dr Simon Dowell BSc (Hons), DPhil

Formerly Head of International Affairs at the Faculty of Biological and Earth Sciences, LJMU and now Associate Dean (Strategy & Development) at the Faculty of Health and Life Sciences at Oxford Brookes University. After completing his PhD at the University of Oxford, worked as a research biologist at the Game Conservancy Trust where he co-founded and chaired the IUCN Species Specialist Group on Partridges, Quails and Francolins. His work on the Sichuan Hill Partridge is a major part of NEZS's Sichuan Forest Conservation Programme in China which he co-ordinates and for which he has been awarded the zoo's Honorary Conservation Fellowship. Takes a keen interest in local conservation and was a Council Member and Chair of the Conservation Committee for the Cheshire Wildlife Trust from 2004 to 2008.

Prof Russell Newton BSc, PhD, DSc, FRSC

Professor of Biochemistry at Swansea University until retirement in 2008, when elected Emeritus Professor, and formerly Lead Director of Biomolecular Analysis Mass Spectrometry Facility. As a biochemist, involved in various multidisciplinary projects, including the development of Seracitin®, an antibiotic extracted from natural sources, and of DisiAq®, which has attained publicity recently for its contribution in stimulating the first successful breeding of rare endangered frogs at Paignton Zoo. Currently Chair of Scientific Advisory Board of Endocrine Pharmaceuticals.

Miss Angela Pinnington BSc (Hons)

Management Consultant specialising in Business Performance Improvement and Strategy. Currently running a business providing management training and coaching. Also a trustee of Ariel Trust, an education charity working with disadvantaged young people. Previously a director of UK and Irish companies.

Dr Judith Skerritt BSc, MSc, PhD

After graduating in Mathematics in Canada, gained a PhD in Pure Mathematics from the University of Liverpool before taking lecturing positions, including head of department, in Montreal. In 1993 established a local veterinary practice with her husband where she directed the business and operational aspects. In 1999 along with three other colleagues, she established VetMRI which was the world's first mobile MRI facility for animals. She was Business Director of Vet MRI for five years. In 2004 established with her husband a large multidiscipline veterinary referral hospital in the North West. Was Business Director and co-owner of this company. Was the Principal of a newly established veterinary nursing college which she set up within the hospital. Was a Trustee of the NEZS from 2001 to 2008 and Chairperson of the Education Committee. Was re-elected as a Trustee of the NEZS in 2009.

Mr Simon Venables FCA MBA MA (Cantab) BA (Hons)

Assistant Finance Director and Head of Internal Audit at Bibby Line Group in Liverpool, with previous experience as Audit Senior Manager at KPMG. A Chartered Accountant, spent 13 years with KPMG in Liverpool after graduating from Cambridge University (Geography) in 2000. Completed an MBA at Manchester Business School in 2009.

Prof Peter Wheeler BSc, PhD

Executive Dean of the Faculty of Science and Professor of Evolutionary Biology at Liverpool John Moores University. He graduated in Zoology from Durham University where he also completed his doctorate on reptilian and mammalian thermoregulation. Subsequent research covered a range of topics, including birds of prey and dinosaurs, but has focussed primarily on early human evolution. In his current role of Executive Dean he has responsibility for the delivery of education and research across a wide range of life and physical sciences, together with associated supporting activities including strategic planning, finance, resourcing and oversight of development projects. A long standing zoo enthusiast, Professor Wheeler has been a regular Chester Zoo visitor since 1981. He is also a keen birder and wildlife photographer and has travelled extensively in Europe, Africa, Asia, South America and the Arctic in pursuit of these interests.

Mr Tony Williams

After a long career as a senior executive in financial services with a major Chester-based bank, now runs a successful consultancy with his wife, helping businesses with their development and future strategy. Tony was a Trustee of the Friends of The Potteries Museum and Art Gallery for a number of years and was involved in their fundraising programme to enable the Museum to buy the important Anglo Saxon "Staffordshire Hoard" exhibits. A keen supporter and Trustee of the zoo for nearly 20 years and served as Chairman of the Council of Trustees of the Society from 2004 to 2010 and was re-elected as a Trustee for a further term in 2012.

BIRD STOCKLIST

		Stock 31/12/15			Acquisitions			Births			Deaths			Dispositions			Stock 31/12/16		
Preferred Scientific Name	**Common Name**	**M**	**F**	**U**	**M**	**F**	**U**	**M**	**F**	**U**	**M**	**F**	**U**	**M**	**F**	**U**	**M**	**F**	**U**
Casuarius casuarius	Southern cassowary	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Crax blumenbachii	Red-billed curassow	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Guttera pucherani	Kenya crested guineafowl	4	3	0	0	0	0	0	0	0	1	0	0	0	0	0	3	3	0
Arborophila gingica	Collared Partridge	4	7	0	0	0	0	0	0	0	1	2	0	0	0	0	3	5	0
Rollulus rouloul *	Crested wood partridge	8	7	0	0	0	0	0	0	1	2	3	1	0	0	0	6	4	0
Tragopan temminckii	Temminck's tragopan	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Tragopan caboti	Cabot's tragopan	2	3	0	0	0	0	2	0	1	0	0	1	1	1	0	3	2	0
Lophophorus impejanus	Himalayan impeyan pheasant	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Lophura inornata	Salvadori's pheasant	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0
Lophura hatinhensis	Vietnamese pheasant	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0
Syrmaticus reevesii	Reeve's pheasant	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Chrysolophus amherstiae	Lady Amherst's pheasant	1	2	0	0	0	0	0	0	1	0	0	1	0	0	0	1	2	0
Polyplectron chalcurum	Bronze-tailed peacock pheasant	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	2	2	0
Polyplectron napoleonis	Palawan peacock pheasant	4	8	0	0	0	0	0	0	1	0	0	0	1	5	0	3	3	1
Argusianus argus	Great argus	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Afropavo congensis	Congo peacock	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Anser erythropus	Lesser white-fronted goose	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Branta ruficollis	Red-breasted goose	3	3	4	0	0	0	0	0	2	0	0	1	0	0	2	3	3	3
Dendrocygna viduata *	White-faced whistling duck	1	0	50	0	0	0	0	0	0	1	1	2	0	0	6	2	5	34
Anas capensis	Cape teal	1	1	9	0	0	0	0	0	0	0	0	0	0	0	0	1	1	9
Anas erythrorhyncha *	Red-billed pintail	3	1	4	0	0	0	0	0	0	0	0	0	0	0	0	3	1	4
Aythya baeri	Baer's pochard	13	11	1	0	0	0	0	0	9	0	2	1	8	2	0	5	7	9
Aythya fuligula	Tufted duck	0	0	4	0	0	0	0	0	0	0	0	0	0	0	3	0	0	1
Aythya nyroca *	Ferruginous Duck	1	2	7	0	0	0	0	0	11	0	0	5	0	0	0	5	4	0
Marmaronetta angustirostris *	Marbled teal	1	4	3	0	0	0	0	0	0	0	0	0	0	0	0	1	4	3
Netta rufina	Red-crested pochard	3	1	0	0	0	0	0	0	0	1	0	0	0	0	0	2	1	0
Oxyura leucocephala *	White-headed duck	2	6	6	0	0	0	0	0	5	0	0	4	0	0	2	2	6	5
Sarkidiornis melanotos	African comb duck	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Tadorna ferruginea	Ruddy shelduck	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	0
Thalassornis leuconotus leuconotus	African white-backed duck	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0
Spatula hottentota *	Hottentot teal	3	3	1	0	0	0	0	0	0	0	1	0	0	0	0	3	2	1
Spatula querquedula	Garganey	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0
Asarcornis scutulata	White-winged duck	1	3	0	0	0	0	0	4	1	0	0	1	0	0	0	1	7	0
Lophodytes cucullatus	Hooded merganser	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Mergellus albellus	Smew	1	4	4	0	0	0	0	0	0	0	0	0	0	0	0	1	4	4
Spheniscus humboldti	Humboldt penguin	8	7	26	0	0	0	0	0	11	0	0	8	0	0	0	8	7	29
Phoenicopterus	Flamingo	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Phoenicopterus chilensis	Chilean flamingo	46	50	2	0	0	0	0	0	14	0	0	3	0	0	0	46	50	13
Phoenicopterus ruber	Caribbean Flamingo	52	44	9	0	0	0	0	0	15	1	1	3	0	0	0	51	43	21
Ciconia nigra	Black stork	2	2	0	0	0	0	0	0	1	0	1	1	0	0	0	2	1	0
Geronticus eremita	Waldrapp ibis	12	8	5	0	0	0	1	1	7	2	0	2	1	1	5	10	8	5

BIRD STOCKLIST

Platalea leucorodia	Eurasian spoonbill	5	3	1	0	0	0	0	0	1	0	1	1	0	0	0	5	2	1
Egretta garzetta	Little egret	0	1	2	0	0	0	0	0	1	0	0	1	0	0	0	0	1	2
Scopus umbretta	Hamerkop	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Aegypius monachus	European Black Vulture	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Coragyps atratus	Black vulture	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Vultur gryphus	Andean condor	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Eurypyga helias	Sunbittern	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1	0
Balearica pavonina pavonina	West African Crowned Crane	2	2	0	0	0	0	1	0	1	0	1	1	0	0	0	3	1	0
Balearica regulorum	Grey-crowned crane	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Bugeranus carunculatus	Wattled crane	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Anitibyx armatus	Blacksmith plover	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	1	0
Caloenas nicobarica	Nicobar pigeon	2	4	1	0	0	0	1	0	0	0	0	0	0	0	0	3	4	1
Chalcophaps indica	Emerald Dove	7	4	0	0	0	0	0	1	12	0	0	8	0	0	0	7	5	4
Columba livia *	Rock dove	0	0	3	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2
Ducula bicolor *	Pied imperial pigeon	2	2	5	0	0	0	0	0	0	0	1	0	0	2	0	1	0	5
Gallicolumba criniger	Mindanao bleeding heart dove	1	5	0	0	0	0	2	0	1	1	0	0	0	2	0	2	3	1
Gallicolumba luzonica	Luzon bleeding heart dove	5	3	0	0	0	0	3	0	1	0	0	0	4	1	0	4	2	1
Gallicolumba rufigula	Golden heart dove	1	2	0	1	1	0	1	1	1	0	0	0	0	0	0	3	4	1
Goura victoria	Victoria crowned pigeon	4	1	0	1	1	0	0	0	0	0	0	0	2	0	0	3	2	0
Otidiphaps nobilis nobilis	Green-naped pheasant pigeon	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Otidiphaps aruensis	White-naped pheasant-pigeon	3	4	0	0	0	0	1	0	4	1	0	0	0	0	0	3	4	4
Ptilinopus melanospilus	Black-naped fruit-dove	3	6	0	0	0	0	1	0	2	1	1	1	0	0	0	3	5	1
Ptilinopus porphyrea	Pink-headed fruit dove	1	3	0	0	0	0	1	0	2	1	3	2	0	0	0	1	0	0
Ptilinopus superbus	Superb fruit dove	9	4	0	0	0	0	5	2	4	1	0	3	0	1	0	13	5	1
Streptopelia risoria *	Java (Barbary) Dove	6	11	7	0	0	0	2	0	0	0	0	0	0	0	0	8	11	7
Zenaida graysoni	Socorro dove	4	4	0	0	0	0	0	0	1	0	0	0	3	3	0	1	1	1
Nesoenas mayeri	Pink Pigeon	2	1	0	0	2	0	0	0	0	0	2	0	0	0	0	2	1	0
Eos histrio	Red-and-blue lory	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Trichoglossus johnstoniae	Mount Apo Lorikeet	4	5	0	0	0	0	0	0	3	1	0	3	0	1	0	3	4	0
Lorius garrulus flavopalliatus	Yellow-backed chattering lory	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0
Psittacula derbiana	Derbyan parakeet	3	4	6	0	0	0	0	0	1	0	0	0	0	0	0	3	4	7
Loriculus galgulus	Blue-crowned parrot	1	1	0	5	3	0	0	0	0	1	1	0	0	0	0	5	3	0
Anodorhynchus hyacinthinus	Hyacinth macaw	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0
Ara glaucogularis	Blue-throated macaw	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Pyrrhura leucotis griseipectus	Grey-breasted Parakeet	8	7	0	1	1	0	0	0	0	3	1	0	3	4	0	3	3	0
Amazona lilacina	Lilacine amazon	2	4	0	0	2	0	0	0	0	0	1	0	0	4	0	2	1	0
Guaruba guarouba	Golden conure	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
Cacatua haematuropygia	Red-vented cockatoo	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0
Cacatua sulphurea	Lesser sulphur-crested cockatoo	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
Tauraco schalowi	Schalow's turaco	2	2	0	0	0	0	0	0	0	0	0	0	1	1	0	1	1	0
Tauraco corythaix fischeri	Fischer's turaco	2	3	0	0	0	0	1	2	1	0	0	1	1	2	0	2	3	0
Tauraco leucolophus	White-crested turaco	1	1	0	0	0	0	1	0	1	0	0	1	1	0	0	1	1	0
Musophaga violacea	Violet turaco	1	2	0	0	0	0	1	0	2	0	0	1	1	1	0	1	1	1

BIRD STOCKLIST (page 3 of 4)

Otus megalotis	Luzon Lowland Scops Owl	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Ptilopsis leucotis	Northern white-faced owl	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Pulsatrix perspicillata	Spectacled owl	1	2	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0
Strix leptogrammica	Brown wood owl	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Strix nebulosa lapponica	Great grey owl	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Strix uralensis	Ural owl	1	1	0	0	0	0	0	0	1	0	0	0	0	0	1	1	1	0
Surnia ulula	Northern Hawk owl	1	1	0	0	0	0	1	0	0	1	0	0	0	0	0	1	1	0
Podargus strigoides	Tawny frogmouth	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Coracias caudatus	Lilac-breasted roller	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Tockus deckeni	Von der Decken's hornbill	0	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0	1	0
Buceros rhinoceros silvestris	Rhinoceros hornbill	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0
Buceros bicornis	Great Hornbill	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Penelopides panini panini	Visayan tarictic hornbill	2	5	0	0	0	0	0	0	0	0	0	0	0	3	0	2	2	0
Aceros leucocephalus	Mindanao Writhe-billed Hornbill	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Rhabdotorrhinus corrugatus	Wrinkled hornbill	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0
Pteroglossus viridis	Green aracari	1	1	0	0	0	0	1	2	0	0	0	0	1	0	0	1	3	0
Lybius melanopterus	Brown-breasted barbet	1	2	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0
Cissa thalassina thalassina	Short-tailed green magpie	4	4	0	0	0	0	2	2	1	1	0	1	0	0	0	5	6	0
Cyanocorax yncas	Green jay	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Cyanopica cyanus	Azure-winged magpie	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Pyrrhocorax pyrrhocorax	Red-billed Chough	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Urocissa erythrorhyncha	Red-billed Blue Pie	2	2	0	0	0	0	2	3	0	0	0	0	0	3	0	4	2	0
Pycnonotus jocosus	Red-whiskered bulbul	4	4	6	0	0	0	0	2	6	0	0	2	0	0	0	4	6	10
Zosterops eurycricotus	African montane white-eye	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0
Irena puella	Fairy bluebird	4	3	0	1	0	0	1	2	3	0	0	3	0	0	0	6	5	0
Aplonis panayensis *	Asian Glossy Starling	0	0	60	0	0	0	0	0	9	0	0	4	1	0	1	4	2	140
Cinnyricinclus leucogaster	Amethyst Starling	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Cosmopsarus regius	Royal Starling	1	2	0	0	0	0	0	0	2	1	0	0	0	0	0	0	2	2
Lamprotornis iris *	Emerald starling	0	0	43	0	0	0	0	0	0	0	0	1	0	0	0	0	0	80
Leucopsar rothschildi	Bali mynah	5	12	0	0	0	0	0	2	4	0	0	4	4	0	0	1	14	0
Mino dumontii	Yellow-faced mynah	0	0	0	1	2	0	0	0	0	0	2	0	0	0	0	1	0	0
Onychognathus morio	Red-winged starling	1	1	0	0	0	0	1	0	1	0	0	1	0	0	0	2	1	0
Scissirostrum dubium	Scissor-billed Starling	10	7	0	5	2	0	0	2	1	1	2	1	2	0	0	12	9	0
Spreo bicolor	Pied starling	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Spreo superbus	Superb starling	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Copsychus malabaricus	White-rumped Shama	1	8	0	1	0	0	0	0	8	0	0	3	0	5	0	2	3	5
Cossypha niveicapilla	Snowy-headed robin chat	2	2	0	0	0	0	1	1	6	0	1	6	0	0	0	3	2	0
Turdus boulboul	Grey-winged blackbird	3	3	0	0	0	0	0	0	0	0	0	0	1	1	0	2	2	0
Zoothera citrina	Orange-headed thrush	1	3	0	0	0	0	0	0	0	0	0	0	0	2	0	1	1	0
Zoothera dohertyi	Chestnut-backed thrush	0	3	0	1	0	0	0	0	3	0	0	1	0	0	0	1	3	2
Dryonastes courtoisi	Blue-crowned laughing thrush	4	5	0	1	0	0	0	0	0	1	3	0	1	1	0	3	1	0
Garrulax bicolor	Black & White Laughingthrush	5	4	0	0	0	0	4	5	12	1	0	12	0	0	0	8	9	0
Leiothrix lutea *	Pekin robin	2	2	30	0	0	0	0	0	26	0	0	6	0	0	4	1	1	44

BIRD STOCKLIST (page 4 of 4)

Liocichla omeiensis	Grey-cheeked Liocichla	7	3	0	1	1	0	2	0	10	2	1	10	2	0	0	6	3	0
Trochalopteron milnei	Red-tailed laughing thrush	3	3	0	0	1	0	3	1	4	0	1	4	2	2	0	4	2	0
Foudia madagascariensis *	Red fody	0	0	25	0	0	0	0	0	3	0	0	1	0	0	0	0	0	27
Ploceus cucullatus cucullatus *	Village Weaver	0	0	28	0	0	0	0	0	8	0	0	11	0	0	0	0	0	35
Ploceus nigricollis nigricollis	Black-necked weaver	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Taeniopygia guttata guttata *	Timor Zebra Finch	10	13	0	0	0	0	0	0	0	1	1	0	0	0	0	10	12	0
Lonchura oryzivora *	Javan sparrow	0	0	208	0	0	0	0	0	24	0	0	22	0	0	56	0	0	205
Lonchura fuscata	Timor sparrow	1	1	6	0	0	0	0	0	2	0	0	2	0	0	0	1	1	6
Coccothraustes affinis	Collared grosbeak	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Icterus oberi	Montserrat oriole	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0
Paroaria dominicana	Pope cardinal	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Ramphocelus bresilius	Brazilian tanager	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
		383	413	570	25	20	0	42	33	253	30	37	154	43	52	80	387	387	741
		1366			**45**			**328**			**221**			**175**			**1515**		

** denotes managed in groups*

FISHES STOCKLIST (page 1 of 2)

		Stock 31/12/16			
Preferred Scientific Name	**Common Name**	**M**	**F**	**U**	
Gnathonemus petersii *	Long-nosed Elephant Trunk Fish	0	0	6	
Barbus hulstaerti *	Butterfly barb	3	3	45	**
Boraras Brigittae *	Barb	0	0	25	
Boraras merah *	Phoenix rasbora	0	0	151	
Danio margaritatus *	Celestial pearl danio	1	2	0	
Devario malabaricus *	Giant Danio	0	0	61	
Garra barreimiae *	Omani Blind Cave Fish	0	0	29	
Microrasbora *	Dwarf rasbora	0	0	11	
Notropis chrosomus *	Rainbow shiner	0	0	133	**
Puntius *	Barb	0	0	1500	
Puntius bandula *	Barb	0	0	16	
Desmopuntius foerschi *	Barb	0	0	20	
Desmopuntius hexazona *	Barb	0	0	64	
Desmopuntius rhomboocellatus *	Barb	0	0	15	
Puntius titteya *	Cherry barb	2	2	156	**
Rasbora caudimaculata *	Greater scissortail	0	0	39	
Rasbora dorsiocellata *	Eyespot rasbora	0	0	579	
Rasbora kalochroma *	Clown rasbora	0	0	15	
Rasbora trilineata *	Threelined scissortail rasbora	0	0	1476	
Sundadanio axelrodi *	Neon green rasbora	0	0	35	
Chromobotia macracanthus *	Clown loach	0	0	5	
Acantopsis choirorhynchos *	Horseface loach	0	0	11	
Ambastaia sidthimunki *	Dwarf loach	0	0	22	
Gastromyzon borneensis *	Loach	0	0	48	
Hemigrammus rhodostomus *	Rummynose tetra	0	0	30	
Hyphessobrycon erythrostigma *	Bleeding heart tetra	0	2	34	
Hyphessobrycon pyrrhonotus *	Flame-back Bleeding Heart Tetra	0	0	33	
Iguanodectes geisleri *	Lizard tetra	0	0	10	
Inpaichthys kerri *	Purple Emperor Tetra	3	1	0	
Moenkhausia pittieri *	Diamond tetra	10	8	40	
Nematobrycon lacortei *	Rainbow tetra	0	0	18	**
*Nematobrycon palmeri**	Emperor tetra	1	0	0	
Paracheirodon axelrodi *	Cardinal tetra	0	0	30	
Pristella maxillaris *	X-ray tetra	0	0	3	
Thayeria boehlkei *	Penguin Tetra	0	0	2	
Synodontis njassae *	Lake Malawi Upside-down Catfish	0	0	6	
Synodontis polli *	Poll's upsidedown catfish	0	0	1	
Brochis splendens *	Brochis Catfish	0	0	8	
Corydoras reticulatus *	Reticulated Corydoras	0	0	4	
Corydoras sterbai *	Sterba's catfish	0	0	63	
Baryancistrus demantoides *	Catfish (Green Phantom)	0	0	5	
Hemiancistrus dolichopterus *	Bristlenoe Plecostomus	3	3	58	
Melanotaenia *	Rainbowfish	1	0	0	
Melanotaenia boesemani *	Boeseman's rainbowfish	1	0	0	
Melanotaenia lacustris *	Lake Kutubu Rainbow Fish	0	0	12	
Pachypanchax sakaramyi *	Killiefish	0	0	60	**
Fundulus bermudae *	Bermuda killifish	0	0	14	
Ameca splendens *	Butterfly Goodeid	0	0	615	
Skiffia francesae *	Golden Saw-finned Goodeid	0	0	11	**
Zoogoneticus tequila *	Crescent Zoe	0	0	65	**
Aplocheilichthys normani *	Topminnow	0	0	30	
Hemirhamphodon *	Halfbeak	0	1	0	
Oryzias sarasinorum *	Duck-billed Fish	1	1	0	
Doryichthys deokhatoides *	Pipefish	1	3	3	**
Hippocampus abdominalis *	Big-bellied Seahorse	8	3	1	**
Serranus tortugarum *	Chalk seabass	0	0	22	
Pseudochromis fridmani *	Orchid dottyback	0	0	3	
Pterapogon kauderni *	Emporor/Banggai Cardinal Fish	0	0	8	
Chelmon rostratus *	Copperband butterflyfish	0	0	1	
Centropyge bicolor *	Bicolor angelfish	0	0	1	
Centropyge tibicen *	Keyhole angelfish	0	0	1	
Cichlasoma bocourti *	Golden mojarra	0	0	4	
*Paretroplus damii**	Damba	0	0	20	
Paretroplus kieneri *	Kieneri cichlid	0	0	25	
Paretroplus menarambo *	Pin Striped Damba	0	0	13	
Pterophyllum scalare *	Freshwater angelfish	0	0	7	
Acanthochromis polyacanthus *	Spiny anemonefish	0	0	10	
Amphiprion frenatus *	Tomato Clown Fish	0	0	1	
Amphiprion ocellaris *	Common Clownfish	0	0	13	
Chrysiptera parasema *	Goldtail damselfish	0	0	2	
Macropharyngodon bipartitus *	Vermiculate Wrasse	0	0	1	
Pseudocheilinus hexataenia *	Sixline wrasse	0	0	1	
Lipophrys pholis *	Shanny blenny	0	0	5	
Hypseleotris compressa *	Empire gudgeon	0	0	2	**
Gobiodon okinawae *	Golden goby	0	0	1	
Periophthalmus novemradiatus *	Pearse's mudskipper	0	0	14	
Pomatoschistus minutus *	Sand goby	0	0	1	
Stiphodon semoni *	Goby	0	0	41	
Siganus vulpinus *	Foxface rabbitfish	0	0	3	
Ctenochaetus tominiensis *	Bristle-tooth Tang	0	0	1	
Zebrasoma flavescens *	Yellow tang	0	0	8	
Ctenopoma ansorgii *	Ornate ctenopoma	1	0	0	
Betta pallifina *	Pallifina betta	0	0	12	
Betta hendra *	Betta	1	0	34	**
Parosphromenus linkei *	Liquorice Gourami	0	0	19	
Parosphromenus nagyi *	Nagy's licorice gourami	0	0	33	

FISHES STOCKLIST (page 2 of 2)

Trichogaster leerii *	Pearl Gourami	3	0	276	
Luciocephalus pulcher *	Giant pikehead	0	1	0	
Canthigaster valentini	Saddled puffer	0	0	1	
		40	30	6202	
		6272			

** denotes managed in groups*

*** denotes bred in the collection in 2016*

AMPHIBIAN STOCKLIST

		Stock 31/12/15			Acquisitions			Births			Deaths			Dispositions			Stock 31/12/16		
Preferred Scientific Name	**Common Name**	**M**	**F**	**U**	**M**	**F**	**U**	**M**	**F**	**U**	**M**	**F**	**U**	**M**	**F**	**U**	**M**	**F**	**U**
Typhlonectes natans *	Rio Cauca Caecilian	0	0	10	0	2	0	0	0	0	0	0	2	0	0	4	4	2	0
Ambystoma dumerilii *	Lake Patzcuaro salamander	0	0	12	0	0	20	0	0	0	0	0	13	0	0	0	0	0	19
Ingerophrynus divergens *	Toad	0	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14
Dendrobates auratus	Green & black poison dart frog	8	6	2	0	0	0	0	0	1	0	0	3	0	0	0	8	6	0
Dendrobates azureus *	Dyeing Poison Dart Frog	11	8	7	2	1	1	0	0	1	1	2	1	0	0	0	12	7	8
Mannophryne trinitatus *	Trinidad poison dart frog	0	0	0	0	0	44	0	0	0	0	0	20	0	0	0	0	0	24
Phyllobates terribilis *	Golden poison dart frog	0	0	40	0	0	26	0	0	7	0	0	32	0	0	0	1	1	39
Oophaga pumilio	Strawberry poison frog	0	0	7	0	0	0	0	0	3	0	0	2	0	0	0	0	0	8
Excidobates mysteriosus *	Marañón poison frog	0	0	47	0	0	0	0	0	4	0	0	4	2	2	0	2	5	36
Anotheca spinosa *	Spine-headed tree frog	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	4
Trachycephalus resinifictrix	Mission golden-eyed tree frog	1	3	1	0	0	0	0	0	0	1	1	1	0	0	0	0	2	0
Agalychnis moreletii *	Morelet's tree frog	6	6	7	0	0	0	0	0	0	5	4	1	0	0	0	5	4	0
Cruziohyla calcarifer *	Splendid leaf frog	0	0	0	0	0	14	0	0	0	0	0	1	0	0	0	0	0	13
Leptodactylus fallax	Mountain chicken frog	4	14	0	5	9	0	0	0	0	3	4	0	0	2	0	6	17	0
Boophis rappiodes *	Ranomafana tree frog	0	0	0	0	0	8	0	0	0	0	0	0	0	0	8	0	0	0
Mantella aurantiaca *	Golden mantella	33	17	96	0	0	0	0	0	3	1	0	5	0	0	0	21	11	111
Mantella expectata *	Blue-legged mantella	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12
Mantella madagascariensis *	Malagasy mantella	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Dyscophus guineti	Sambava tomato frog	0	2	0	0	0	10	0	0	0	0	0	0	0	2	0	0	0	10
Scaphiophryne gottlebei *	Red rain frog	0	0	40	0	0	0	0	0	0	0	0	3	0	0	0	0	0	37
Scaphiophryne madagascariensis *	Madagascar rain frog	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	10
Sylvirana maosonensis *	Mao-Son frog	2	2	111	0	0	0	0	0	0	0	0	5	0	0	0	2	2	106
Fejervarya limnocharis *	Frog	0	0	7	0	0	0	0	0	0	0	0	1	0	0	6	0	0	0
Staurois guttatus *	Black-spotted rock frog	0	0	32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31
Staurois parvus *	Splash frog	0	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17
Nyctixalus pictus *	Painted Indonesian tree frog	1	6	29	0	0	0	0	0	45	0	0	0	2	4	30	2	7	36
Polypedates dennysi *	Denny's tree frog	0	0	20	0	0	0	0	0	0	2	0	2	0	0	0	0	0	16
Polypedates otilophus *	Bornean eared frog	3	2	60	0	0	0	0	0	57	0	0	19	0	0	22	3	2	76
Rhacophorus exechopygus *	Tree frog	1	0	2	0	0	0	0	0	0	1	0	0	0	0	2	0	0	0
Rhacophorus prominanus *	Jade gliding tree frog	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
		70	66	575	7	12	137	0	0	121	14	11	116	4	10	72	66	66	628
		711			**156**			**121**			**141**			**86**			**760**		

 # denotes managed in groups

MAMMALS STOCKLIST

		Stock 31/12/15			Acquisitions			Births			Deaths			Dispositions			Stock 31/12/16		
Preferred Scientific Name	**Common Name**	**M**	**F**	**U**	**M**	**F**	**U**	**M**	**F**	**U**	**M**	**F**	**U**	**M**	**F**	**U**	**M**	**F**	**U**
Echinops telfairi	Lesser Madagascar hedgehog tenrec	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0
Macroscelides proboscideus	Short-eared elephant shrew	2	5	0	1	0	0	3	1	0	0	1	0	1	2	0	5	3	0
Orycteropus afer	Aardvark	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
Procavia capensis	Rock hyrax	1	4	0	0	0	0	1	3	0	0	0	0	0	3	0	2	4	0
Elephas maximus	Asian elephant	1	5	0	0	0	0	0	1	0	0	0	0	0	0	0	1	6	0
Choloepus didactylus	Linne's two-toed sloth	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Myrmecophaga tridactyla	Giant anteater	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0
Tupaia belangeri	Northern tree shrew	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
Eulemur rufus	Red-fronted lemur	4	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0
Hapalemur alaotrensis	Alaotran gentle lemur	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0
Lemur catta	Ring-tailed lemur	12	0	0	0	7	0	0	0	0	0	0	0	0	0	0	12	7	0
Daubentonia madagascariensis	Aye-aye	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Callithrix pygmaea niveiventris	Eastern pygmy marmoset	1	1	0	0	0	0	1	0	4	1	0	1	0	0	0	1	1	3
Leontopithecus chrysomelas	Golden-headed lion tamarin	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
Saguinus bicolor	Pied tamarin	4	4	0	0	0	0	0	0	2	0	0	2	0	0	0	4	4	0
Saguinus imperator subgrisescens	Emperor tamarin	3	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	0	0
Saguinus oedipus	Cotton-top tamarin	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	1	0
Cebus xanthosternos	Buffy-headed capuchin	3	1	3	0	0	0	0	0	0	0	0	0	0	0	0	3	1	3
Callicebus cupreus	Coppery titi	1	1	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0
Pithecia pithecia	White-faced saki	1	1	0	0	0	0	0	0	1	0	0	1	0	0	0	1	1	0
Alouatta caraya	Black howler	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0
Ateles fusciceps	Black-headed spider monkey	4	4	0	0	1	0	1	0	0	2	0	0	0	0	0	3	5	0
Macaca nigra	Sulawesi crested macaque	3	11	0	0	0	0	2	1	0	0	0	0	0	0	0	5	12	0
Macaca silenus	Lion-tailed macaque	3	10	0	0	0	0	0	0	0	0	1	0	0	0	0	3	9	0
Mandrillus sphinx	Mandrill	3	10	0	0	0	0	0	0	0	0	0	0	0	0	0	3	10	0
Hylobates lar	Lar gibbon	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Hylobates moloch	Javan gibbon	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	2	1	0
Pan troglodytes	Chimpanzee	7	13	0	0	0	0	0	0	0	0	1	0	0	0	0	7	12	0
Pongo pygmaeus	Bornean orangutan	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	0
Pongo abelii	Sumatran orangutan	2	5	0	0	0	0	0	0	0	0	0	0	0	0	0	2	5	0
Callosciurus prevostii rafflesii	Prevost's squirrel	0	0	0	1	1	0	0	0	3	0	0	0	0	0	0	1	1	3
Cricetomys gambianus	Gambian giant pouched rat	2	1	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	0
Hypogeomys antimena	Votsovotsa/Giant jumping rat	0	0	0	1	1	0	0	0	3	1	0	0	0	0	0	0	1	3
Acomys cilicicus *	Turkish spiny mouse	20	30	2	0	0	0	0	0	291	58	25	147	0	0	0	45	68	7
Phloeomys pallidus	Slender-tailed cloud rat	1	2	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0
Heterocephalus glaber *	Naked mole-rat	2	1	57	0	0	0	0	0	47	0	2	32	0	0	0	18	28	10
Hystrix africaeaustralis	Cape porcupine	3	1	0	1	0	0	0	0	0	1	0	0	2	0	0	1	1	0
Hydrochoerus hydrochaeris	Capybara	1	3	0	0	0	0	8	6	0	2	1	0	0	0	0	7	8	0
Pteropus rodricensis	Rodrigues Fruit Bat	77	92	0	0	0	0	31	31	9	9	8	8	0	0	0	99	115	1
Carollia perspicillata *	Seba's short-tailed bat	61	112	0	0	0	0	35	10	43	49	36	51	0	0	0	145	208	11
Acinonyx jubatus soemmeringii	Central African cheetah	4	3	0	0	0	0	0	0	0	0	0	0	1	0	0	3	3	0
Felis silvestris grampia	Scottish wild cat	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	2	1	0
Leptailurus serval	Serval	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0

MAMMALS STOCKLIST (page 2 of 2)

Panthera leo persica	Asiatic lion	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0
Panthera onca	Jaguar	1	2	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0
Panthera tigris sumatrae	Sumatran tiger	2	2	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0
Arctictis binturong whitei	Palawan binturong	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	1	0
Mungotictis decemlineata	Narrow-striped mongoose	1	1	0	1	0	0	0	0	0	0	0	0	1	0	0	1	1	0
Helogale parvula	Dwarf mongoose	1	4	0	1	1	0	0	0	1	1	2	1	0	2	0	1	1	0
Suricata suricatta	Slender-tailed meerkat	8	8	0	0	0	0	5	4	4	0	1	4	4	9	0	9	2	0
Lycaon pictus	African hunting dog	4	1	0	2	2	0	0	0	0	0	1	0	4	1	0	2	1	0
Speothos venaticus	Bush dog	2	4	0	0	0	0	4	3	2	0	1	2	1	0	0	5	6	0
Helarctos malayanus	Malayan sun bear	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Tremarctos ornatus	Spectacled bear	1	1	0	0	0	0	0	0	1	0	0	1	0	0	0	1	1	0
Aonyx cinerea	Oriental small-clawed otter	1	1	0	0	0	0	2	3	0	0	0	0	0	0	0	3	4	0
Pteronura brasiliensis	Giant otter	0	3	0	1	0	0	0	0	0	0	1	0	0	0	0	1	2	0
Ailurus fulgens fulgens	Red panda	1	2	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0
Equus grevyi	Grevy's zebra	1	3	0	0	0	0	1	1	0	0	1	0	0	0	0	2	3	0
Equus hemionus onager	Persian onager	3	6	0	0	0	0	0	0	0	0	1	0	0	0	0	3	5	0
Tapirus indicus	Malayan tapir	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	1	2	0
Tapirus terrestris	South American tapir	2	2	0	0	0	0	0	0	0	0	1	0	0	0	0	2	1	0
Diceros bicornis michaeli	Eastern Black rhinoceros	3	6	0	0	0	0	1	0	0	0	0	0	0	1	0	4	5	0
Rhinoceros unicornis	One-horned rhinoceros	1	2	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0
Babyrousa babyrussa	Babirusa	2	5	0	0	0	0	2	2	1	1	2	0	0	1	0	3	4	1
Phacochoerus africanus	Warthog	3	5	0	0	0	0	1	3	0	0	1	0	0	0	0	4	7	0
Potamochoerus porcus	Red River hog	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Sus cebifrons	Visayan warty pig	3	4	0	0	0	0	1	1	0	1	1	0	0	0	0	3	4	0
Camelus bactrianus	Bactrian camel	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
Tragulus nigricans	Philippine mouse-deer	1	1	0	0	0	0	0	1	1	0	0	1	0	0	0	1	2	0
Pudu puda	Southern pudu	3	1	0	0	0	0	1	0	0	0	0	0	0	0	0	4	1	0
Rucervus eldii thamin	Burmese brow-antlered deer	0	16	0	1	0	0	0	0	0	0	1	0	0	8	0	1	7	0
Rusa alfredi	Philippine Spotted Deer	3	2	0	0	0	0	1	0	0	0	0	0	2	1	0	2	1	0
Giraffa camelopardalis rothschildi	Baringo giraffe	3	6	0	0	0	0	1	0	0	0	0	0	0	0	0	4	6	0
Okapia johnstoni	Okapi	2	2	0	1	0	0	0	0	0	0	0	0	0	0	0	3	2	0
Antilope cervicapra	Blackbuck	0	6	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0
Madoqua kirkii	Kirk's dik-dik	1	3	0	1	0	0	2	1	0	0	0	0	0	0	0	4	4	0
Bos javanicus	Javan banteng	4	5	0	0	0	0	1	2	0	1	0	0	0	0	0	4	7	0
Bubalus depressicornis	Lowland Anoa	1	2	0	0	0	0	0	1	0	0	0	0	0	0	0	1	3	0
Syncerus caffer nanus	Congo buffalo	1	6	0	0	0	0	0	0	0	0	0	0	0	0	0	1	6	0
Tragelaphus eurycerus isaaci	Eastern bongo	0	6	0	0	0	0	0	0	0	0	1	0	0	0	0	0	5	0
Tragelaphus imberbis	Lesser kudu	1	2	0	0	0	0	1	2	1	1	1	1	0	0	0	1	3	0
Tragelaphus spekii gratus	West African Sitatunga	1	15	0	0	0	0	0	6	0	0	3	0	0	0	0	1	18	0
Cephalophus natalensis	Red forest duiker	1	1	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0
Hippotragus equinus	Roan antelope	3	8	0	0	0	0	2	3	1	3	1	0	0	2	0	2	8	1
Oryx dammah	Scimitar-horned oryx	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
		308	495	62	15	15	0	110	87	415	135	98	252	24	41	0	471	672	43
		865			**30**			**612**			**485**			**65**			**1186**		

** denotes managed in groups*

PLANT STOCKLIST

Scientific Name	Common Name	No. of Species / sub-species	No. of Specimens
National Plant Collections			
Copiapoa spp	Cacti	25	259
Matucana spp	Cacti	15	132
Nepenthes spp	Pitcher Plants	133	581
Turbinicarpus spp	Cacti	20	201
Pluerothallidinae	Orchids		
Acianthera spp	Orchids	14	20
Acronia spp	Orchids	24	46
Anathallis spp	Orchids	9	15
Ancipitia spp	Orchids	2	12
barbosella spp	Orchids	5	13
Brenesia	Orchids	1	7
Dracula spp	Orchids	49	72
Dresslerella	Orchids	2	4
Dryadella spp	Orchids	17	33
Echinosepala	Orchids	1	8
Lepanthes	Orchids	17	27
Lepanthopsis spp	Orchids	5	8
Masdevallia spp	Orchids	171	310
Myoxanthus spp	Orchids	13	23
Octomeria Spp	Orchids	10	15
Ophidion spp	Orchids	1	1
Orbis spp	Orchids	1	1
Pabstiella spp	Orchids	3	5
Phloeophila spp	Orchids	2	3
Platystele spp	Orchids	11	20
Pleurothallis spp	Orchids	159	297
Pleurothallopsis spp	Orchids	2	3
Porroglossum spp	Orchids	13	18
Restrepia spp	Orchids	36	113
Scaphosepalum spp	Orchids	19	41
Specklinia spp	Orchids	12	22
Stelis spp	Orchids	49	90
Trichosalpinx spp	Orchids	12	24
Trisetella spp	Orchids	7	19
Zootrophion spp	Orchids	11	31
Other Notable Plant Species			
Achyranthes arborescens	Chaff Tree		1
Amesiella monticola	Orchid		1
Amesiella philipensis	Orchid		1
Amorphophallus titanum	Titan Arum		5
Ansellia africana	Orchid		2
Araucaria araucana	Monkey Puzzle Tree		5
Butia eriospatha	Palm		1
Coccothrinax borhidiana	Palm		1
Coincya monensis ssp. Monensis	Isle of Man Cabbage		20
Cotoneaster cambricus	Wild Cotoneaster		3
Dionaea muscipula	Venus Flytrap		12
Diospyros egrettarum	Ebony		2
Doricera trilocularis			1
Dracaena concinna	Bois De Chandelle		15
Encephalartus ferox	Cycad		1
Encephalartus nataliensis	Cycad		1
Equisetum x meridionale	Southern Horsetail		3
Fuchsia loxensis	Fuchsia sp		1
Fuchsia steyermarkii	Fuchsia sp		1
Gastonia mauritiana	Ox Tree		3
Ginkgo biloba	Maidenhair Tree		1
Hibiscus fragilis	Mandrinette		5
Hibiscus insularis	Philip Island Hibiscus		2
Hyophorbe lagenicaulis	Bottle Palm		10
Hyophorbe verschaffeltii	Spindle palm		10
Jubeae chilensis	Chilean wine palm		6
Juniperus communis	Common Juniper		14
Latania loddigesii	Palm		7
Latania verschaffeltii	Palm		15
Lobelia digitalifolia			2
Luronium natans	Floating Water Plantain		400
Magnolia wilsonii	Wilson Magnolia		1
Mammillaria spp	Cacti	128	163
Metasequoia glyptostroboides	Dawn Redwood		2
Neobenthamia gracilis	Orchid		1
Olearia hectorii	Hector's Tree Daisy		1
Palicourea crocea			2
Paphiopedilum spp	Slipper orchids	46	48
Passiflora jatunsachensis	Passion flower sp		1
Phoenix threophrasti	Cretan date palm		1
Pholidota chinensis	Orchid		1
Pilularia globulifera	Pilwort		20
Pleione formosana	Orchid		1
Populus nigra ssp. betulifolia	Black Poplar		60
Potamogeton compressus	Grasswrack Pondweed		770
Pteris adscensionis	Fern		1
Pritchardia thurstonii	Palm		1
Sabal bermudaana	Palm		1
Sarcanthemum coronopus			2
Sarcochilus falcatus	Orchid		1
Sequoiadendron giganteum	Giant Sequoia		2

PLANT STOCKLIST

Stachys alpina	Limestone woundwort		3
Tillandsia dyeriana	Bromeliad		1
Vanda tessellata	orchid		1
Veronica bahamensis			1
Zanthoxylum heterophyllum			1
	Number of species	**1099**	

INVERTEBRATES STOCKLIST

		Stock 31/12/16		
Preferred Scientific Name	**Common Name**	**M**	**F**	**U**
Cassiopea *	Frilled upside-down jellyfish	0	0	89
Euplexaura *	Gorgonian	0	0	3
Lobophytum *	Leather coral	0	0	3
Sinularia *	Soft Coral	0	0	5
Sinularia flexibilis *	Slimy leather coral	0	0	5
Xenia elongata *	Yellow star coral	0	0	3
Anemonia viridis *	Snakelocks anemone	0	0	32
Cereus pedunculatus *	Daisy anemone	0	0	24
Entacmaea quadricolor *	Bladdertipped anemone	0	0	5
Heteractis *	Sea Anemone	0	0	96
Actinodiscus *	Mushroom Polyp	0	0	195
Acropora *	Staghorn coral	0	0	3
Acropora aculeus *	Staghorn coral	0	0	3
Acropora cervicornis *	Staghorn coral	0	0	3
Acropora gomezi *	Coral	0	0	4
Acropora millepora *	Staghorn coral	0	0	8
Acropora prostrata *	Coral	0	0	4
Acropora tenuis *	Staghorn coral	0	0	4
Acropora turaki *	Coral	0	0	4
Acropora yongei *	Staghorn coral	0	0	1
Montipora *	Montipora coral	0	0	37
Montipora capitata *	Coral	0	0	2
Montipora confusa *	Encrusting coral	0	0	3
Montipora danae *	Coral	0	0	2
Montipora digitata *	Finger coral	0	0	3
Montipora foliosa *	Hard coral	0	0	4
Montipora friabilis *	Orange plating coral	0	0	4
Montipora monasteriata *	Montipora coral	0	0	2
Montipora orientalis *	Montipora coral	0	0	2
Pocillopora damicornis *	Brush coral	0	0	11
Seriatopora *	Bird nest coral	0	0	4
Seriatopora caliendrum *	Hard coral	0	0	12
Stylophora *	Cauliflower coral	0	0	3
Stylophora pistillata *	Pink cauliflower coral	0	0	11
Plerogyra sinuosa *	Bubble coral	0	0	2
Turbinaria peltata *	Bowl Coral	0	0	2
Hydnophora *	Horn coral	0	0	4
Galaxea fascicularis *	Ivory coral	0	0	6
Fungia fungites *	Mushroom coral	0	0	4
Clithon diadema *	Tooth snail	0	0	3
Clithon corona *	Horned nerite	0	0	3
Neritina *	Olive nerite	0	0	5
Neritina natalensis *	Zebra nerite snail	0	0	6
Vittina *	Tooth snail	0	0	1
Marisa cornuarietis *	Giant ramshorn snail	0	0	47
Pomacea canaliculata *	Apple snail	0	0	50
Tylomelania *	Freshwater snail	0	0	135
Brotia pagodula *	Pagoda snail	0	0	1
Strombus *	Fighting conch	0	0	6
Nassarius vibex *	Common eastern mud snail	0	0	21
Partula varia *	Partula snail	0	0	150
Poecilozonites bermudensis *	Bermuda land snail	0	0	200
Hirudinaria manillensis *	Buffalo leech	0	0	18
Heterometrus longimanus *	Asian forest scorpion	0	0	5
Damon diadema *	Giant banded tailless whipscorpion	2	1	0
Cyrtopholis femoralis *	Montserrat tarantula	1	20	218
Lampropelma violaceopes *	Singapore blue tarantula	0	2	0
Lasiodora parahybana *	Brazilian salmon tarantula	1	1	0
Nephila inaurata *	Golden silk spider	3	8	70
Atyopsis moluccensis *	Bamboo shrimp	0	0	2
Caridina *	Shrimp	0	0	5
Caridina gracilirostris *	Mosquito Shrimp	0	0	2
Caridina dennerli *	Cardinal shrimp	0	0	6
Caridina multidentata *	Yamato shrimp	0	0	141
Neocaridina *	Red Cherry Shrimp	0	0	11
Atyoida pilipes *	Green lace shrimp	0	0	3
Lysmata amboinensis *	Cleaner Shrimp	0	0	1
Clibanarius *	Striped hermit crab	0	0	3
Ciliopagurus strigatus *	Halloween hermit crab	0	0	1
Geosesarma *	‘Red Devil’ Vampire Crab	12	20	109
Periplaneta americana *	American cockroach	40	40	400
Therea olegrandjeani *	Cockroach	0	0	115
Gromphadorhina portentosa *	Madagascar hissing cockroach	0	0	3
Hymenopus coronatus *	Pink orchid mantis	0	0	12
Deroplatys desiccata *	Malaysian dead-leaf mantis	1	2	0
Hierodula membranacea *	Giant Asian Mantis	1	1	0
Stilpnochlora couloniana *	Florida Leaf Katydid	30	37	32
Ancylecha fenestrata *	Malaysian Leaf Katydid	0	0	5
Homoeogryllus xanthographus *	Cricket	30	40	60
Phobaeticus magnus *	Walkingstick	0	2	0
Epidares nolimetangere *	Walkingstick	9	5	8
Heteropteryx dilatata *	Malaysian Jungle Nymph	11	20	150
Phyllium giganteum *	Giant leaf insect	0	0	9
Achrioptera fallax *	Walkingstick	0	0	110
Eurycantha calcarata *	Giant stick insect	22	18	60
Ramulus *	Walkingstick	8	22	80
Myronides *	Walkingstick	17	13	100
Phasma gigas *	Giant stick insect	22	15	7

INVERTEBRATES STOCKLIST

Chalcosoma caucasus *	Atlas beetle	0	1	17
Dynastes hercules *	Western hercules beetle	0	0	40
Mecynorrhina polyphemus *	Polyphemus flower beetle	4	4	60
Mecynorrhina ugandensis *	Beetle	4	3	50
Pachnoda marginata *	Sun beetle	15	20	200
Smaragdesthes africana *	Emerald beetle	16	17	201
Xylotrupes gideon *	Elephant beetle	10	10	192
Graphium agamemnon *	Tailed Jay	0	0	16
Papilio memnon *	Great Mormon	0	0	15
Papilio rumanzovia *	Scarlet swallowtail	0	0	4
Euploea core *	Common Crow	0	0	16
Idea leuconoe *	Giant Wood Nymph	0	0	35
Caligo memnon *	Giant Owl	0	0	19
Morpho peleides *	Blue Morpho	0	0	35
Heliconius ismenius *	Tiger Longwing	0	0	4
Heliconius melpomene *	Postman	0	0	26
Heliconius sara *	Sara Longwing	0	0	16
Anartia amathea *	Scarlet Peacock	0	0	4
Hamadryas amphinome *	Cracker	0	0	4
Hypolimnas bolina *	Great Eggfly	0	0	21
Siproeta stelenes *	Malachite	0	0	13
Atta cephalotes **	Leafcutter ant	0	0	1
Campnotus compressus	Ant	0	0	1
Ampulex compressa *	Emerald cockroach wasp	55	28	248
Hemithyrsocera histrio *	Cockroach	0	0	6
Asterina gibbosa *	Cushion Starfish	0	0	1
Ophiarachna incrassata *	Green Brittle Starfish	0	0	22
Diadema antillarum *	Long Spined Urchin	0	0	1
Mespilia globulus *	Colored tuxedo urchin	0	0	8
		314	**350**	**4262**
		4926		

** denotes managed in groups*

*** denotes bred in the collection in 2016*