

ZSL
LIVING CONSERVATION

The Zoological Society of London Annual Review 2001



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Front cover: Okapi
Images: PA©

Above: ZSL staff worked on a large number of conservation and research projects throughout the world in 2001. Many other collaborations are in development.

To achieve and promote the worldwide conservation of animals and their habitats.

ZSL pursues this mission by:

- 1 keeping and presenting animals at London Zoo and Whipsnade Wild Animal Park in accordance with best practice;
- 2 giving priority to species that are threatened in the wild;
- 3 increasing public understanding of animals and their welfare and of the issues involved in their conservation;
- 4 maintaining an outstanding education and information programme, particularly for schoolchildren and families;
- 5 undertaking field conservation programmes, both in Britain and abroad;
- 6 developing its role as a leading centre for research and conservation biology and animal welfare;
- 7 fulfilling its role as a learned society and force for zoology and animal conservation through publications, scientific meetings, lectures, the award of prizes for outstanding achievement and the promotion of conservation policy.

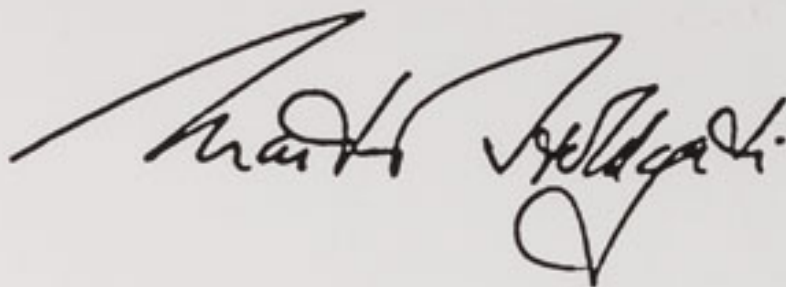
PRESIDENT'S INTRODUCTION

As this *Annual Review* makes clear, 2001 was a difficult year for ZSL. The outbreak of Foot and Mouth Disease with suspected (though happily unconfirmed) cases only ten miles away made our closure of Whipsnade inevitable. We feared large financial losses, and the fact that instead we ended the year in surplus is a testimony to the skill of our Officers, Directors and staff in cutting expenditure sharply.

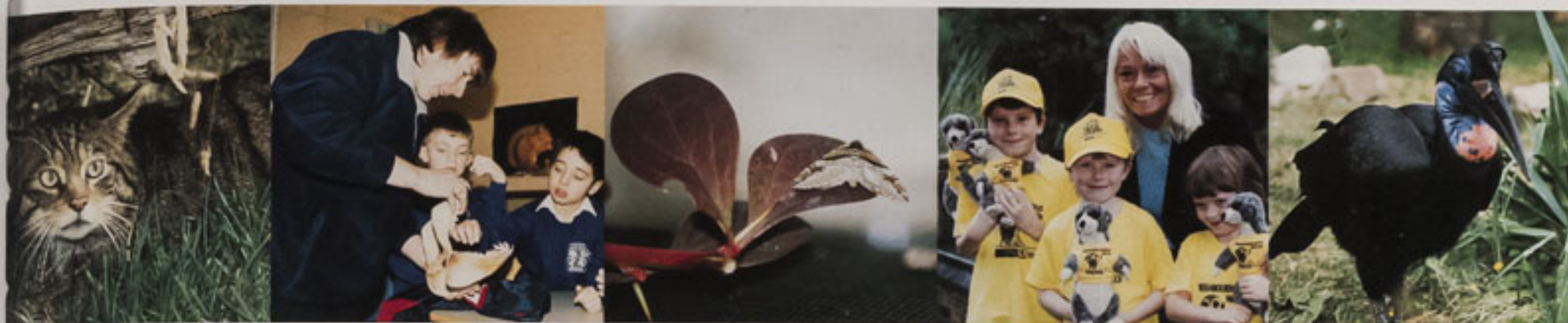
Of course this sudden economy did damage, although much of the work we would have done was deferred rather than abandoned, and essential development – like the new elephant housing at Whipsnade – went ahead. But the proximity of the epidemic raised major issues of policy to which I alluded last year. Happily, the supreme international body on animal diseases, the Office International des Epizooties (OIE) in Paris, recommended last April that collections of rare and threatened species in zoos could be protected by vaccination without prejudice to the FMD-free status of a country, provided that the animals concerned were properly isolated. The European Union accepted this proposal, recognising that endangered species are a valuable part of the global heritage and should be protected as far as possible. We did not need to press the Government to use this vaccination option in 2001, but the OIE and EU decisions make the horrible prospect of compulsory slaughter of some of the world's rarest animals less threatening.

Managing the complex finances of a body like the ZSL is never easy. Last year it imposed particular demands on our Finance Department, and on our Treasurer, Harry Wilkinson. Our Society, like many charitable organisations of its kind, is directed on a day-to-day basis by the Director General and staff, but managed and administered by its Officers and Council on behalf of the Fellowship. In the past year, Harry Wilkinson put in a great many hours on our behalf. He has now stepped down as Treasurer, and I would like to record here our gratitude to him for his seven years of outstanding service.

May I conclude by thanking all my fellow Officers, Council Members, Fellows, Directors and the staff of the Society for their dedication in the past year. I have every confidence that, thanks to their efforts, 2002 will be a much better year for ZSL.



Sir Martin Holdgate
President



Patron: Her Majesty The Queen

Members of Council during 2001

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Robert Wingate†

† To 19 June 2001

* From 19 June 2001



2001 marked ZSL's 175th Anniversary and the 70th year of Whipsnade's opening to the public. In what should have been a year of celebration, however, major plans to celebrate these events had to be shelved early in the year because of uncertainty and financial pressures arising from the onset of Foot and Mouth Disease in the UK.



Above: Signs of the times: closed gates at Whipsnade and vehicle spraying at London Zoo during the height of the Foot and Mouth Disease crisis.

Below: Electronic media proved highly successful in attracting Animal Adopters.

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In the third week of February the first case of Foot and Mouth Disease was identified at Great Warley in Essex and over the next few days more and more cases were confirmed in Essex and Northumbria. ZSL's veterinary science group quickly established effective communication with MAFF officials so that we were aware both of new confirmed cases and locations under investigation. This latter information indicated suspected cases within ten miles of Whipsnade and led to the early decision to close the Park to the public on 22 February. At the same time, precautionary measures were applied at London Zoo, so extra barriers, foot dips and disinfectant matting became a way of life for staff and visitors for an extended period.

As the disease epidemic spread, distinct clusters emerged well away from London and Whipsnade. After an enormous effort to implement precautionary measures on a big site with many free-roaming susceptible animals, we were able to reopen Whipsnade to visitors on foot on 19 April and subsequently to cars during the third week of July. However, the damage had been done. Visitor numbers at Whipsnade were down by around 85,000 at that time and at London Zoo, visitor numbers in March and April had been half of those normally expected, resulting in a 40,000 deficit. Thereafter, the weekly visitor numbers were subject to the normal vagaries of the weather, which was broadly worse than average. As a result, total visitor numbers for the year

at Whipsnade were around 350,000 and at London Zoo 910,000.

The financial impact of Foot and Mouth Disease was forecast early on during the epidemic and a loss of gate income of more than £1M was predicted. We applied cost saving measures across ZSL, and these were significant enough not only to cancel out the lost income but also to cover a downward revaluation of our investments as the result of the stock market decline, especially following 11 September. As the Treasurer's Report shows, the financial outcome for the Society was exceptional under such difficult circumstances.

The financial pressures resulting from lost zoo visitors resulted in efforts to advance the development of new income sources. A particular success during the year was the sale of animal adoptions over the internet. Working with lastminute.com, London Zoo's adoptions team ran a Christmas campaign which was highly successful, netting over £100,000 in the run up to the holiday and contributing to an increase of nearly 70% in income over the previous year. Adoptions were well up at Whipsnade too, and during the Park's closure many people took out adoptions



as a way of helping in difficult times. Over 50% of the adoptions during the year were generated through the website, demonstrating the major impact of this developing aspect of our activities.

During 2001 negotiations took place with the Greater London Authority to allow free school visits to London Zoo for London's schoolchildren. In an innovative agreement signed for the new school year which started in September, the GLA is subsidising visits for up to 180,000 schoolchildren by providing the funds for ZSL to employ more teaching staff and to invest in our educational facilities. The initial signs are that this scheme will be very popular. It is intended to spread the visits over the full school year and we have 'capped' daily visits at around 2,000 children. The result will be more schools visiting in the autumn, winter and spring, so providing undercover picnic facilities was an important consideration. We are grateful to Thames Water for sponsoring the provision of these facilities.

The year saw significant change in the team of Directors at ZSL. Council approved a change in the management structure, moving from a divisional to a cross-Society functional basis. Over the second half of the year the new model was implemented, changing the roles undertaken by individual Directors. Along the way Stuart Earley, Dr Jo Gipps and Norman Reed each chose to move on to new roles in the visitor attraction world, and we record here our thanks to them for their work for ZSL over the years and wish them well for the future. In the final quarter of the year, four new Directors joined – Chris West (Zoological), Dr Glyn Davies (Conservation Programmes), Brian Oldman (Commercial) and Michael Bird (Finance). They joined the existing team of Dr Michael Dixon (Director General), Ian Meyrick (Human Resources) and Professor Georgina Mace (Science).

As with other UK academic research establishments, the Institute of Zoology was subjected to HEFCE's Research Assessment Exercise, the results of which were announced in December. A rating of Grade 4 was retained, something of an achievement given the



large number of changes over the assessment period, and this confirms that the Institute's research is attaining national significance in all areas, and international importance in some. The Institute had a good year for grant applications with 15 new grants won, six of which were over £100,000 in lifetime value.

In October, ZSL's difficult year was compounded by the tragic death of Senior Elephant Keeper, Jim Robson, in the course of his work at London Zoo. This tragedy, still the subject of internal and official inquiries at the time of writing, shook the staff throughout ZSL. We take the opportunity of paying tribute to his years of dedicated work for ZSL, primarily with elephants and in expressing our heartfelt sympathy to his family.

Subsequently the three London Zoo elephants were moved to their permanent new home at Whipsnade, where the magnificent newly expanded facilities were completed in December. The transfer of the elephants, one at a time but all in one day, was almost certainly the most complex inter-zoo move of large animals ever undertaken in the UK. Memorials to Jim Robson at both London Zoo and Whipsnade, where he was to relocate with the elephants he loved, are planned for implementation shortly.



Above, top: Jim Robson, Senior Elephant Keeper, at London Zoo.

Above: Flowers were left as a tribute following Jim's tragic death.



Above, top left and right: Sunrise: Layang Layang, one of London Zoo's elephants, is loaded onto the transporter and (right) arrives at her new home, Whipsnade.

Above: Reception in the Web of Life. Dr Abdul Aziz Abuzinada (centre) and Dr Iyad Nader (right).

6 Below: ZSL's new team of Directors: Michael Dixon, Michael Bird; Glyn Davies; Georgina Mace; Ian Meyrick; Brian Oldman; Chris West.

Our overseas conservation work continued during the year with some projects coming to an end and others continuing to develop. The project to establish self-sustaining veterinary clinics in the buffer zone around the Chitwan National Park in Nepal was completed and we will watch with interest how these clinics fare in the future. The donors for the project, the Department for International Development (DFID), the Kadoorie Foundation and the King Mahendra Trust for Nature Conservation have each reported positively on the outcome.

ZSL was represented by three Directors at the opening of a new laboratory block at the King Khalid Wildlife Research Centre (KKWRC) in Saudi Arabia, built through the generosity of His Royal Highness Prince Bandar Al Faisal Bin Abdulaziz. The laboratory facilities increase the capability to undertake molecular genetic work at KKWRC and a full time geneticist is based there looking at the phylogeny of indigenous populations of animals in the region. In July we held a reception in London Zoo's *Web of Life* for Dr Abdul Aziz Abuzinada, Secretary

General of the Saudi National Commission for Wildlife Conservation and Development, for whom we manage KKWRC. Our mutual commitment to this long running project increased during the year, establishing ZSL as a major active force in desert ecosystems and their management.

This *Annual Review* outlines some of ZSL's activities in more detail. The contributions of our dedicated staff, our fellows, volunteers, committee members, visitors and donors are acknowledged by Council with grateful thanks. We have shown that ZSL now has both the financial and organisational resilience to withstand even such a difficult year as 2001, and this augurs well for our future development.

Professor Paul H Harvey FRS
Secretary



ZSL recognises outstanding achievements in the field of zoological research and conservation through its annual presentation of awards and prizes. The awards for contributions to zoology for 2001 are:

The ZSL Frink Medal for British Zoologists

(for significant and original contributions by professional zoologists to the development of zoology in its wider implications)
to Professor Nick Davies, FRS, of the University of Cambridge, in recognition of his contribution to behavioural ecology.

The Scientific Medal

(awarded to zoologists 40 years of age and under, in recognition of scientific merit)
to Dr Alan Cooper, of the University of Oxford, for his research in phylogeography.

The ZSL Marsh Award for Conservation Biology

(for contributions of fundamental science and its application to the conservation of animal species and habitat)
to Dr Eleanor Jane Milner-Gulland, of the Imperial College London, for her contribution to conservation biology.

The Stamford Raffles Award

(for distinguished contribution to zoology, open to amateur zoologists or to a professional zoologist in recognition of contributions which are outside the scope of his or her professional activities and principal specialisation)
to Dr Norman Moore for his research on the ecology and behaviour of dragonflies.

The Thomas Henry Huxley Award

(for original work submitted as a doctoral thesis) to Dr Stephen Rossiter, of the University of Bristol, for his thesis *The causes and consequences of genetic structure in the greater horseshoe bat (Rhinolophus ferrumequinum)*.

The ZSL Marsh Award for Conservation Biology and the Thomas Henry Huxley Award are sponsored by the Marsh Christian Trust.

Honorary Fellowship

to Professor Patrick Bateson, FRS, Provost of King's College, Cambridge and Biological Secretary of the Royal Society. In recognition of a career as a world leader in ethological research.



Left: Katherine Herborn, winner of the Prince Philip Prize 2000, with (left to right) Sir Martin Holdgate, President, ZSL; Brian Marsh, Marsh Christian Trust; and Julian Foster, Peter Symonds College.

In our research laboratories, in the field, and in the zoos, ZSL's staff carry out a unique mix of fundamental science, applied conservation biology and practical conservation work to further our goal to maintain populations of wild animals. Here, we present some examples of work completed during the year.

Underpinning analyses and investigations

Strategies and plans to conserve wild species and their habitats need to be based on a sound biological understanding of the target organisms. Whether it involves laboratory work, data analyses, ecological or genetic modelling, ZSL staff continue to contribute advice and guidance based on strong science.

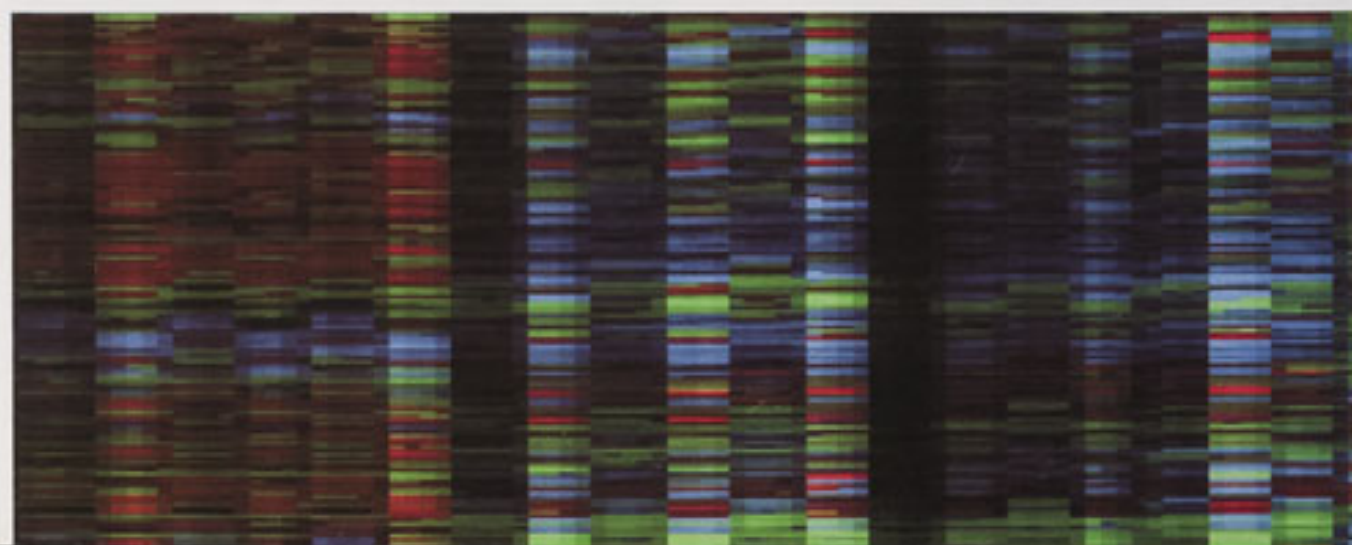
Captive breeding and reintroduction are high profile and expensive methods of conserving species, so it is important that animals included in such programs are correctly identified. The Saudi gazelle, *Gazella saudiya*, was first described in 1935 at a meeting of the Zoological Society of London. Since then, like many other species of large mammal in Arabia, it has suffered from over-hunting and has been considered extinct in the wild for more than ten years. In the early 1990s, three captive populations of gazelles in Arabian Gulf states were identified as Saudi gazelles. These collections were considered possible sources of animals for a captive breeding/reintroduction programme. However, DNA and chromosomal analyses showed that the populations were different from one

another, and that one population was likely to be a mixture of two species, one of them possibly being the Saudi gazelle.

In collaboration with the National Commission for Wildlife Conservation and Development in Saudi Arabia, we sequenced a region of the cytochrome *b* gene from museum skins of Saudi gazelles collected in the 1930s. This showed that the true Saudi gazelle is a close relative of African dorcas gazelles but is a distinct taxon. Unfortunately, none of the three captive populations of putative Saudi gazelles matched the sequences from the museum skins, but they did match sequences from extant gazelle species from Africa and central Asia. From this we have to conclude that there are no known living specimens of *Gazella saudiya* and it is likely that the species is extinct. Although this is a depressing outcome, the genetic analysis averted a potentially expensive conservation programme that would have bred and possibly reintroduced non-native gazelles.

A review of how the disciplines of population and evolutionary biology can assist in defining strategies for the effective storage, management, and use of

Right: An image of cytochrome *b* sequence data. Each vertical lane represents an individual animal and each colour represents one of the four bases that go to make up DNA: by examining the sequence of colours in each lane it is possible to decipher the DNA sequence for that gene in that animal.





frozen semen banks led to some important practical conclusions. These included how individuals should be selected to contribute to the banks in order to maximise genetic diversity and thereby help meet population survival goals, and how species should be selected for storage to help meet biodiversity conservation goals. There are many advantages in using genome resource banks in conservation programmes that require active management of isolated populations of threatened species. In the face of increasing restrictions on the movement of live animals, material from genome banks can be an important means to maintain gene flow. However, perhaps the greatest benefit is providing security against the increasing pressures facing many wild populations. Before these advantages can be realised, however, a considerable research effort will be required for each species to enable effective selection of donors and recipients to meet genetic goals, and to identify procedures for optimal storage and utilisation of germplasm between stored and living populations.

A major genetic problem in maintaining small populations (in zoos, natural reserves, etc.) is the inescapable genetic changes associated with inbreeding and genetic drift over time. This puts them in jeopardy of immediate extinction due to inbreeding depression and also risks their survival in the long run due to the depletion of genetic variation and loss of evolutionary potential. To minimise inbreeding and drift, a simple method was developed. This optimises the use of DNA marker and pedigree information

in order to minimise the variation in the genetic contribution. Substantial increases in effective population size can be achieved, but the effectiveness of the method depends on factors such as the genome size, fertility, male/female ratio and the marker information available.

Understanding about the genetic similarity and the past history of natural populations can be an important part of conservation strategies. Using genetic tools, one can estimate contemporary exchange of breeding individuals, the extent to which populations have interbred in the past and the influence of historical changes in population size.

For example, genetic analysis of the population structure of sika deer (*Cervus nippon*) in Japan has revealed a complex picture of ancient and contemporary influences. The underlying population structure of sika in Japan probably stems from the last ice age. It consists of two distinct lineages of deer, one in northern and one in southern Japan. Within these groups the genetic similarity of the deer is generally related to geographical distance. However, this ancient population structure has been perturbed by contemporary human influences such as habitat fragmentation and over exploitation leading to genetic bottlenecks. Bottlenecks have caused rapid genetic changes so that some populations are more genetically distinct from close neighbours than they are from populations in distant parts of Japan. The genetic influence of habitat fragmentation follows the pattern of economic development in Japan. The biggest effects of fragmentation are seen on Honshu, the most developed island, where there is no contemporary genetic exchange between populations. In Hokkaido, which is still heavily forested, there are only minor effects of fragmentation and contemporary exchange of breeding individuals remains high.

The taxonomic status of the wildcat in Scotland has long been the subject of controversy. Skeletal evidence suggests that an indigenous British wild cat (*Felis silvestris*) has been present since

Left: Frozen semen banks in the Institute of Zoology.

Below: Sika hind. Genetic analysis of the population structure of sika deer in Japan has revealed a complex picture of ancient and contemporary influences.

Photo: Simon Goodman





the end of the last ice-age. However, the presence of domestic cats (*Felis catus*) in pre-Roman iron-age settlements is well documented. There is therefore the possibility that hybridisation, coupled with persecution of wild-living cats, has led to the partial or complete replacement of the ancestral wildcat. In collaboration with Scottish Natural Heritage, we carried out a genetic survey of wild-living cats in Scotland using microsatellite markers. We have discovered that the wild-living cats comprise two genetic groups, with many intermediates. One group is genetically very similar to a control sample of domestic cats, and the other has morphological characteristics that have been traditionally considered 'wildcat'. We have therefore concluded that there is still evidence of the continued existence of the ancestral wildcat in Scotland. However, it is also clear that there has been substantial hybridisation.

In 2001 ZSL published the first edition of the *Global Tiger Projects Database*, which documents non-governmental organisation (NGO) funding for tiger projects worldwide. The database shows that 21st Century Tiger (our fundraising coalition with Global Tiger Patrol, which passed the half-million-pound fundraising mark during 2001) is a significant force. ZSL's co-ordination of the zoo tiger programme in Europe and Russia expanded to also cover Australasia, at the request of the Australasian Zoo Association.

Scientific studies of natural populations

In the UK and overseas, in terrestrial, marine and freshwater habitats, our staff are involved in studying a diverse range of wild species and the threats that they face. New techniques and the application of a broad skill base have led to some important conclusions from our work over the past year.

In August 1768, Sir Joseph Banks set sail in *The Endeavour* on a famous voyage of discovery. In the English Channel he recorded his first biological observation: "... saw this Even a shoal of fish which are particularly called Porpoises by the seaman, probably the *Delphinus Phocoena* of Linneaus, as their noses are very blunt". Today we would be very fortunate to observe schools of porpoises in these waters. Indeed, a detailed survey in the mid-1990s failed to sight any harbour porpoises in the Channel.

In the light of this situation, the UK Marine Mammal Strandings Project (UKMMSP) was set up to co-ordinate research into the health, biology and toxicology of stranded marine mammals within the UK from 1990. The research of UKMMSP is conducted by the Institute of Zoology in partnership with the Natural History Museum and the Scottish Agricultural College (Inverness), and is funded by the Department of the Environment, Fisheries and Rural Affairs.

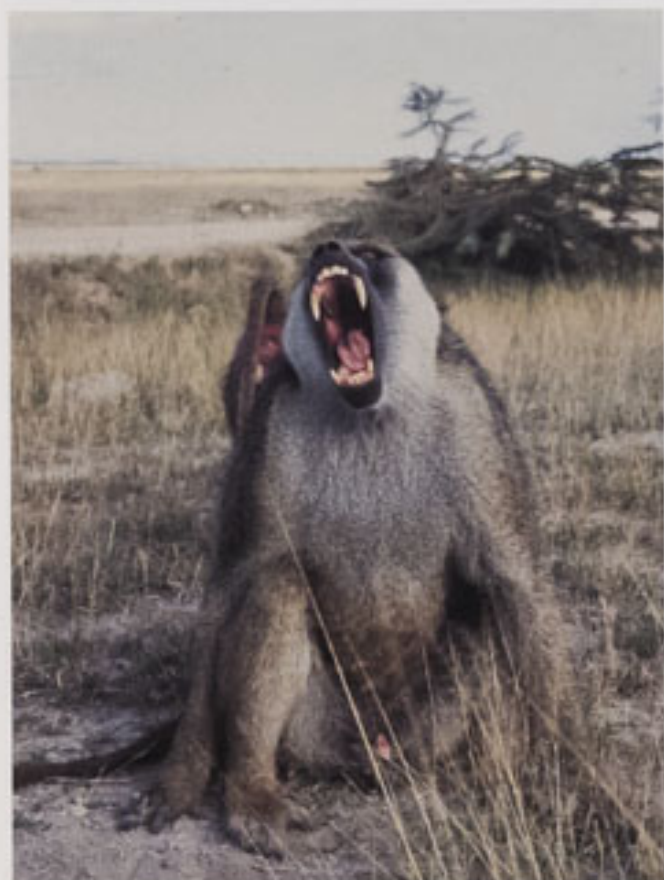
Environmental pollution has been proposed as one threat to the harbour porpoise (*Phocoena phocoena*), and we investigated whether long-term exposure to heavy metals, including immunosuppressive metals like mercury, is associated with infectious disease. Post-mortem investigations on 86 harbour porpoises found dead along the coasts of England and Wales, between 1990 – 1995, identified some that were healthy but had died from physical trauma (most frequently entrapment in fishing gear) while others had died of infectious diseases caused by parasitic, bacterial, fungal and viral pathogens. We found that mean liver concentrations of mercury were significantly higher in the porpoises that died of infectious disease compared to healthy porpoises that died from physical trauma, supporting the idea that environmental pollution is an important threat to cetaceans living in UK waters.

Above: Scottish wildcat, subject of a genetic survey in Scotland.
Photo: Scottish Natural Heritage



More recent research (during 2000 and 2001) has shown that entanglement in fishing gear (bycatch) was the most common cause of mortality of the stranded common dolphins (*Delphinus delphinus*). However, the most common cause of death in stranded harbour porpoises during 2000 and 2001 was fatal attack from bottlenose dolphins (*Tursiops truncatus*).

The research programme continues, and will now be applied to marine turtles because every year a number strand on the coastline of the UK. Most are leatherback turtles (*Dermochelys coriacea*) although strandings of other turtle species have been recorded. This new research topic will allow us to learn more about the threats posed to these fantastic



creatures, and it will also form part of the implementation of the UK Biodiversity Action Plan for marine turtles.

Scientists have long been fascinated by the vocalisations of the non-human primates. Of particular interest has been the question of whether primates can recognise social companions just from their voices. We examined this question in yellow baboons (*Papio cynocephalus cynocephalus*) in Kenya, focussing on the calls given by females during mating. Acoustic analyses indicated that calls from individual females were distinct. Experiments in the field further demonstrated that males could tell females apart on the basis of these vocal signals. These results suggest that male baboons could use mating calls to monitor the location and sexual behaviour of females in their group, and modify their mating strategy accordingly.

To understand animal populations from the standpoint of both conservation and basic science, it helps to know their genetic structure. For this reason, our researchers have carried out a detailed genetic investigation of the ant *Leptothorax acervorum*. The social structure of this twig-nesting ant is particularly interesting, as each colony may house several queens. The research confirmed that cohabiting queens are generally related, and established that each queen mates with a single, unrelated male. This shows that many queens do not disperse from the natal



Above, top: UK Marine Mammal Strandings Project.

Above: Institute of Zoology researchers have carried out a detailed genetic investigation of the ant.

Left: Yellow baboon: Do primates recognise social companions just from their voices?

Photo: Stuart Semple



nest, but they must avoid inbreeding by mating only with males from other nests.

We studied the effects of several potentially important factors on offspring survival in one of our rarest mammals, the greater horseshoe bat (*Rhinolophus ferrumequinum*). Surprisingly, a genetic measure thought to reflect outbreeding was found to be more important than any of the ecological factors examined. This has implications for conservation management. Most genetic mixing among colonies probably occurs through mating behaviour, when female horseshoe bats from different colonies visit solitary territorial males, in widely distributed caves. Our results suggest that these mating sites, often overlooked by conservationists, should be protected, since they provide opportunities for outbreeding, thereby potentially promoting offspring survival.

The monitoring and management of species depends on reliable population estimates, and this can be both difficult and very costly for cryptic large animals that live in forested habitats. Recently developed camera trap techniques have been used as an effective means of estimating population size of individually identifiable species, such as tigers (using mark-recapture estimates).

We reviewed camera trapping information on tigers from 19 studies across the species' range, and found that the number of camera days per tiger photograph is related to estimates of tiger density. This led to a new method which does not rely on individual identity and may be particularly useful for providing an index of population density of other species that cannot be individually identified. We used these data to predict the effort required to determine whether tigers, or other rare species, exist in an area. We also used these techniques to investigate tigers living in an oil palm plantation in south Sumatra, to develop management protocols that will allow tigers to use plantations as corridors between isolated forested areas.

Conservation of rare and endangered populations in the wild

Often our work focuses on pressing conservation issues, and our expertise is called upon to provide specific advice and guidance. Here we review some of the issues that members of ZSL staff have tackled over the last year.

Two species of vulture in India, the Indian white-backed (*Gyps bengalensis*) and long-billed vulture (*Gyps indicus*), have declined by > 90% during the last decade. Both species were once regarded as very common, but now they are listed as critically endangered. With funding from the UK Government's Darwin Initiative for the Survival of Species, we

Above: Setting a camera trap, and (below) one of the first pictures.

Right: ZSL is working to find out the cause of population declines in Indian white-backed and long-billed vultures.

Photo: Guy Shorrock, RSPB





are working to find out the cause of these declines and to develop a recovery programme for the affected species. So far, along with our partner organisations – the Bombay Natural History Society (BNHS), the Royal Society for the Protection of Birds (RSPB) and the National Bird of Prey Centre (NBPC) – we have staffed and equipped a vulture diagnostic laboratory in India. A Vulture Care Centre, for the study of sick birds, is under construction. We are also training Indian scientists in the techniques required to investigate the declines and to implement a recovery plan. More information on this project can be found on the website www.vulturedeclines.org

ZSL staff participated in a pilot study looking at the effects of a dam on fish populations in the Babai River, an exceptionally diverse, warm-water river in western Nepal. Its rich diversity was illustrated by the 819 fish, of 33 species, sampled in only four days. Studies of the dam and structured interviews with local inhabitants, however, revealed that fish populations have decreased over the last ten years due to the dam, which was constructed on the river in the early 90s, and an increase in local populations. This is concerning to the local communities who depend on fishing for food as well as it being an important cultural tradition. A longer term study is planned to gather more detailed baseline information and develop a conservation action plan for the area.

Project Seahorse now has 38 staff working in seven countries and territories. In the Philippines, teams supported through ZSL by the Community Fund are engaged in both biological and socioeconomic research. Surveys of 38 fishing grounds in the Danajon Bank area have shown disturbingly low seahorse populations in reef habitats that have been largely reduced to rubble by dynamite fishing. Discussions with local fishers resulted in a Fishers' Alliance that identified illegal fishing as the major problem and alternative livelihoods as a need. Surveys of six marine protected areas established through the project continue, testing the recovery of habitats and fish populations. The aquaculture programme has ended in Vietnam, and the results will be used as one alternative livelihood option in the Philippines.

COMMUNITY FUND

Lottery money making a difference



Above, left: Electrofishing surveys on the Babai River, western Nepal.

Above, right top: Women tapi fishing.

Above, right: Fish measurement training at the Babai River Dam.

Nepal photos: Alice Courage

Left: Teams supported through ZSL by the Community Fund are engaged in research. Joel Erediano, Project Seahorse, running socio-economic interview feedback sessions with fishers in the Philippines.

Photo: Project Seahorse



Above, top: Jacques Flamand at handover of Jagatpur Veterinary Clinic to Clinic User Group.

Above: Phoenix Public Anti-poaching Inspectors Project: members of the team with confiscated weapons.

Below: Sinai rosefinch, St Katherine's Protectorate.

Photo: Dina and Ali Rafiq



21st Century Tiger, mentioned earlier, had another successful year and funded five projects: habitat mapping and public inspectors enforcing anti-poaching measures, in the Russian Far East; a jeep for anti-poaching patrols in India; a research project in primary rainforest in Malaysia; and mapping and predicting habitat loss in Sumatra. No data on tigers and prey had previously been collected in Taman Negara, Malaysia, so the project used camera traps to estimate population. Sixteen individual tigers were photographed, plus an abundance of prey, so the next stage is to analyse and make recommendations for tiger management in the future.

Two field programmes have been working on the disease links between livestock and wildlife, which must be managed for conservation benefits: one in East Africa, the other in Nepal. The second year of ZSL technical assistance to the wildlife component of

the Pan African Disease Surveillance Programme (PACE) programme, in eastern Africa, is focused on rinderpest eradication. Work was carried out in Western Ethiopia, Kenya and Tanzania, and also on lion, rhino and buffalo mortality in Ngorongoro. The most important action was in response to finding an unexpected outbreak of rinderpest in buffalo, in Meru National Park, Kenya – a zone which had just been declared free from the disease by the authorities. This beautiful protected area is frequently invaded by Somali cattle, which are the presumed source of the virus. Work in collaboration with the wildlife and livestock authorities continues to assist in understanding the epidemiology of the last foci of this potentially devastating virus, as well as providing novel insights into the disease ecology, critical to ensuring its final eradication globally.

In Royal Chitwan National Park, Nepal, the Wildlife and Domestic Veterinary Programme reached its conclusion in September after four years. During the year, wildlife captures and investigations of disease of wildlife were undertaken as part of ongoing wildlife management programmes. These provided an opportunity to further train Nepali staff

in improving their wildlife skills, which had increased noticeably. The last of the four veterinary clinics in the buffer zones surrounding the Park was established. At this and the previously established clinics, there was an emphasis on reinforcing the veterinary skills of the technicians and developing their business skills to ensure a sustainable future for the clinics. All the technicians in charge are managing their clinics under the supervision of a local clinic Management Committee. The Wildlife & Domestic Veterinary Programme has proved to be a model project, combining community interests with long-term conservation benefits. The main beneficiaries have been Chitwan National Park and the communities around it where issues of disease and economy are important.



In January, the third group of captive-bred black-and-white ruffed lemurs (*Varecia varecia*) – an adult female and three male offspring – were released by the Madagascar Fauna Group into the Betampona Reserve, eastern Madagascar. The group has adapted well and have had contact with their wild counterparts. Although the group required supplementary feeding in the winter months, they have so far successfully avoided predation by the fossa (*Cryptoprocta ferox*). One male released in 1997 has fully integrated into a wild group, and is independent and thriving. The daughter of a pair from the first release is now paired with a wild adult male, but it will be several years before she is old enough to breed. Overall there are good reasons to be optimistic that the remaining released lemurs will interbreed with the resident population.

During the year ZSL's staff at the King Khalid Wildlife Research Centre have maintained long-term post-release monitoring of the Mountain gazelles

which were reintroduced to the steep limestone gorges of the Ibex Reserve near Howtah in 1991. In a new project, ZSL field staff have also initiated an exciting study of the reserve's population of Nubian ibex. This is the first study of these ibex involving year-round observation and has already produced new insights into breeding behaviour and movements. The importance of our long-term commitment to post-release monitoring and research in this environment is becoming increasingly clear, as the slow changes in rainfall pattern and plant growth in the reserve become apparent, and clearer understanding of gazelle population changes has also been gained.

Work continues in the St Katherine's Protectorate, Sinai, where we have been providing technical support over the past eight years to ensure that tourism development is environmentally sensitive. This requires taking account of pollution and urban development issues, as well as rural development plans for Bedouin tribes, to ensure that the integrity of the protected area is not disrupted and desert animals, such as the Nubian ibex and Sinai rosefinch, continue to survive. Tourist conservation awareness and guide literature have been developed, including a CD-ROM showing plant, animal and cultural diversity in the unique mountainous area.

In the Congo Basin, ZSL has provided technical support to develop patrol-based monitoring techniques for a UNESCO programme in Democratic Republic of Congo (former Zaire). The programme objectives are to provide financial, logistical and diplomatic support to the Congolese Wildlife Agency in its efforts to maintain the country's five World Heritage Sites (Garamba, Okapi, Virunga, Kahusi Biega and Salonga) through the civil war that has devastated the central African country since 1996. The approach involves ground patrol teams collecting and collating information, such as hunting and trapping, to refine management priorities, which gives a basis for a performance-based salary supplement that improves staff morale.



Above: Leaping ibex caught on camera trap, Ibex Reserve, Saudi Arabia.

Photo: King Khalid Wildlife Research Centre

Left: Black-and-white ruffed lemurs.

Photo: Adam Britt

Below: Wild animals are hunted and trapped throughout West and Central Africa, and this 'bushmeat' supports an annual trade exceeding US \$500 million. More than two million tonnes of bushmeat are traded each year.





Education is central to ZSL's mission and covers every area of our activity. Through the two zoos we reach around 1.5 million visitors each year, providing them with information on wildlife and conservation and raising awareness of current issues such as the illegal trade in bushmeat; animal presentations, keeper talks and touch tables also enhance their understanding of the natural world. The work of the Society is also brought to an international audience through our scientific lectures, talks, courses and publications.

Opposite: A poster produced by ZSL and used throughout the organisation.

Below: 10,400 signatures collected by ZSL were taken to Brussels.

Visitor education

As a member of the European Association of Zoos and Aquaria, ZSL supported the EAZA Bushmeat Campaign, which became one of our most important educational activities this year. Zoos in 21 European countries joined forces to campaign against the illegal and unsustainable trade in bushmeat that is seriously threatening many endangered species, particularly gorillas, chimpanzees and other primates. The main aims of the campaign were to raise awareness of unsustainable hunting and loss of biodiversity in Central and West Africa and of the illegal trade in Britain, and to collect signatures on a petition.

Identical information panels on the bushmeat trade were mounted near the chimpanzee enclosures at both Whipsnade and London Zoo whilst additional panels identified all other species in the collection that are hunted for food. Volunteers led activities at London where visitors painted their hands and printed them onto a paper gorilla hand to show their support, while information was woven into keepers' talks and animal presentations

at both zoos. The 10,400 signatures collected by ZSL on the petition were taken to Brussels where the total 2.2 million was handed to the European parliament. Our information panels travelled, too, and provided a backdrop for MEPs and EAZA campaign organisers when they met EU commissioners and asked for their support in addressing the trade with African Heads of State and with those running development projects.

Interpretation is a vitally important part of ZSL's education work. Through information panels and labelling we are able to achieve anything from explaining basic biological facts about a species to raising awareness of conservation needs and demonstrating good conservation practice.

At Whipsnade we have focussed on the new Macaw Aviary in the Bird Garden and a continuation of the work started in 2000 in the Discovery Centre. Following the completion of the Rainforest and Desert areas of the latter, we began work on the Ocean area and Conservation Room. The Ocean exhibits were fitted with new species identification labels in keeping with the style used throughout the other areas. The interpretation for the



What is Bushmeat?

Bushmeat is wild animals hunted for food.

For thousands of years, bushmeat has been a traditional source of food for many local people, especially those that live in forests.

It is important that these indigenous peoples can continue their way of life.



Monkeys for sale in market



Slaughtered gorilla family

However.....

...hunting for bushmeat has now become big business and some of it is illegal.

Wild animals are now hunted for food on a vast scale and the meat is transported to towns and cities.

Among the animals killed are many endangered species such as gorillas and chimpanzees. This hunting is **illegal** and threatens these species with extinction - within the next few decades.

You can help by...

- Learning more about the bushmeat trade
- Signing the petition against **illegal** bushmeat
- Looking out for bushmeat on restaurant menus in Britain, Europe and abroad - **DO NOT** order it!





Conservation Room utilises a computer which has kindly been donated; a PowerPoint presentation was designed to illustrate species that can be seen in the Conservation Room and to explain the various breeding programmes which are currently being carried out there.

Three interpretation panels were produced for the Macaw Aviary; each panel tells a different story relating to macaws in the wild or the macaws at Whipsnade, and once again follows the format now used at various other enclosures around the Park.

At London Zoo, we have introduced a set of panels containing a life-sized sculptured hand or foot of an elephant, gorilla, camel and lion. These have proved very popular with children who place their own hand over the top and compare texture and shape. A new system of mounting information was installed for all basic labels on the aviaries. Light-weight frames allow staff to swap labels instantly and keep up-to-date with the movement of birds in and out of the collection, or to another aviary. The *Conservation in Action* interpretation panels were revised and up-dated and many labels were prepared for new stock in the aquarium.

Throughout the summer, a series of special events – Discovery Days – were held at Whipsnade, run by staff from a number of departments. A different animal was featured each Friday in the school summer holidays. The aims of

each day were to raise awareness of the animal through keeper talks and quizzes, to enhance the visitor experience through activities and to raise funds. The days were well attended with some visitors travelling considerable distances to see their favourite animal.

Programme for schools and colleges

A key achievement this year was the production of an educational wallchart that has been distributed to all schools in the country. We have long wanted to raise awareness of ZSL's work in breeding endangered species and to counter some of the lack of understanding about the role of a modern zoo – a lack that is all too easily exploited by the anti-zoo lobby; a wallchart was our favoured means

Above: Interpretation panels at Whipsnade.

Right: A Good Zoo, ZSL's wallchart for schools.



of achieving this aim and was made possible this year due to sponsorship by The British Land Company PLC. Entitled *A Good Zoo*, the poster explains how conservation breeding is managed by working co-operatively with other good zoos around the world, and how we look after the animals in our care. On the reverse of the wallchart are several activities appropriate for Key Stages 3 and 4. The poster features animals from both London Zoo and Whipsnade and has also been taken by other Federation zoos for their own use.

The temporary closure of Whipsnade and the perception that London Zoo might also have to close due to precautions against Foot and Mouth Disease had a substantial effect on school bookings. Despite a strong start to the year at Whipsnade, we finished the year 9,000 visits down on the same period in 2000. Similarly, organised school visits at London fell by 6,000.

However, numbers received a major boost in the autumn with the generous funding of free school visits for London schools by the Greater London Authority. The Mayor of London, Ken Livingstone, a Fellow and former Vice-President of ZSL, is keen to provide city children with the opportunity to see wild animals and to take advantage of our wide-ranging educational programme. The scheme was launched in September with a mailing to all London state schools and gives the opportunity for every state school to send one year group (secondary) or two classes (primary) on an educational visit each year.

MAYOR OF LONDON

The GLA funding has enabled the London Education team to take on two extra Education Officers and two assistants to welcome schools at the Zoo entrance and help them orientate themselves at the start of their visit. We have also benefited from some additional equipment and teaching materials and the redecoration of the Education Centre.

For the first time for some years, Whipsnade offered guided tours to school groups throughout the spring and summer terms. Each of the four tours



follows a different theme and is led by an Education Officer or Volunteer. This addition to the education programme was well received, with over 900 children having received a guided tour by the end of July. We are looking forward to expanding this activity in 2002.

Another addition to the Whipsnade education programme was a new outreach scheme, which allows an Education Officer to bring conservation into the classroom. The first visit involving live animals was delayed due to Foot and Mouth Disease precautions, but the venture has been well received and will be developed in 2002.

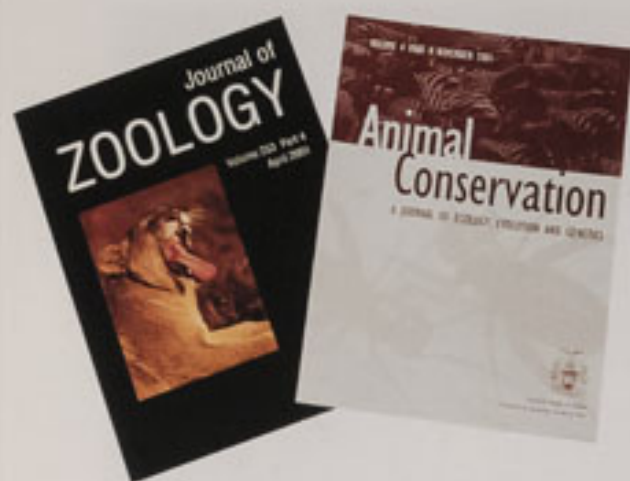
During the year, ZSL became involved in an exciting new project with King's College, London, to develop science education. A collaboration between King's College, The Exploratorium at San Francisco and the University of Santa Cruz, has recently founded CILS (Centre for Informal Learning and Schools). The Centre aims to develop and improve science education and



Above: Taking conservation into the classroom: Whipsnade's outreach scheme.

Far left: The Mayor of London, Ken Livingstone, a Fellow and former Vice-President of ZSL, is keen to provide city children with the opportunity to see wild animals and to take advantage of our wide-ranging educational programme.

Left: A Discovery Day at Whipsnade.



learning in schools and science centres; our initial involvement will be in the development of web-based learning for schools, based upon key breeding programmes.

Alconbury Elementary School (pictured in ZSL's 2000 Report) continued their support of the red pandas at Whipsnade and a special Outreach session was laid on for the school, when a donation to Whipsnade was also received.

Representing ZSL

ZSL education staff continue to play an active part in the wider zoo world. London Zoo's Head of Education was invited as guest speaker at the ALPZA (Latin American Zoo) Conference in Buenos Aires where she presented a paper on the development of *Web of Life*. She was also invited to Rabat Zoo in Morocco to help develop their education programme and to advise on interpretation and routing visitors around the Zoo. We are represented on the Federation of Zoos Education Committee, with the Whipsnade Education Officer being both the Vice Chair of the Committee, and the Eastern Regional Zoo Educators Co-ordinator.

Qualifications and training

Eight students at the Institute of Zoology were awarded PhD degrees. Saffron Townsend received her degree for work on the genetic diversity and the history of domestication in sheep (*Ovis*). Andrew Cunningham completed his thesis on the epidemiology and aetiology of unusual mortality of the common frog (*Rana temporaria*) in Britain. Octavio Paulo was awarded a PhD for his studies on genetic differentiation and conservation of reptile populations in the Iberian Peninsula. Juliet Dukes worked on the role of gene diversity and regulation of olfactory receptors in the homing behaviour of the migratory Atlantic salmon (*Salmo salar*). Jonathan Baillie received a PhD for his field and analytical work on factors associated with persistence and vulnerability of island endemic birds. Susanna Paisley studied the ecology of Andean bears and their interaction with people in Apolobamba, Bolivia. Jakob Bro-Jorgenson completed his empirical

studies in the Serengeti on lekking behaviour of Topi, and Russell Seymour investigated the impact of low level taxonomy on conservation policy with his comparative studies on the species complex of giraffes.

The Master of Science Course in Wild Animal Health (MSc WAH), jointly run with the Royal Veterinary College (RVC), continues to attract a great deal of interest from veterinarians and a full complement of 15 are attending the 2001/2002 course. There are now a total of 85 graduates of the course from 32 countries situated in six continents. Each student carries out a research project and the results are published as theses. Several are currently drafting papers for refereed journals to communicate their important findings. Graduates from the course go on to work in zoos, national parks, universities and other institutes, working with both captive and free-living wild animals. Graduates from the previous year's course have fanned out across the globe to take up challenging positions in Indonesia, Japan, Botswana, Spain and the USA, amongst other locations.

Four trainee keepers at London and two at Whipsnade passed the City & Guilds examination in Zoo Animal Management. Two gained distinctions in the written exam paper. All ZSL's trainee keepers study for this qualification, which comprises written assignments, researching an individual project and undergoing practical assessment in husbandry skills.

Meetings

An essential part of ZSL's work is facilitating the communication of information between professional zoologists, researchers and the general public. We hold four series of meetings, which are open to the public as well as to members of staff.

Tuesday Talks are aimed at a general audience. Nine talks were held during the year, covering a wide range of topics, including *Aliens of inner space*, *Exposing wildlife crime: the undercover work of the Environmental Investigation Agency*, *The real gold of Ghana* and *The changing status of British birds*. *Making waves*, a lavishly illustrated talk by Martha Holmes, a series

producer on *The Blue Planet*, BBC1's landmark production on the world's oceans, described how the series was made and was particularly well attended.

At each Scientific Meeting three speakers provide an overview of important research within a particular field. The six meetings held during the year covered diverse subjects, such as *Population genetics and conservation of wolves in Europe*, *Lemurs – Madagascar's vanishing treasures*, *The return of the beaver*, *European red squirrels: a species at risk?* and *The invaders! The impact of biological invasions and hybridization on native taxa*. In December 2001 a Scientific Meeting entitled *ZSL into the 21st Century* celebrated 175 years at Regent's Park and 70 years at Whipsnade Wild Animal Park.

The Science and Conservation seminars held by the Institute of Zoology comprised talks by invited speakers on subjects relevant to our research; for example, *Vocal communication and social knowledge in elephants*, *Consequences of inbreeding in butterfly metapopulations*, and *Sperm competition and the evolution of ejaculates*.

The 2001 Sir Stamford Raffles lecture, *Embryonic development – from the egg to five fingers*, was given by Professor Lewis Wolpert, CBE, FRS, of the Department of Anatomy and Developmental Biology, University College London. The Singapore Tourism Board and Singapore Airlines again generously sponsored the event.

Publications

Journal of Zoology, ZSL's pre-eminent international journal dedicated to academic zoology, continues to attract contributions from top researchers. During the year 158 original peer-reviewed articles were published in 12 monthly parts of Volumes 253–255, providing comprehensive coverage of the latest research and developments in zoology.

ZSL's quarterly journal *Animal Conservation* provides an important forum for the rapid publication of rigorous empirical or theoretical studies relating to species and population biology. Volume 4 was published in 2001 and contained 39 articles.



Left: *Making waves*, a *Tuesday Talk*, described how the BBC series *The Blue Planet* was made.

Production of Volume 38 of the *International Zoo Yearbook* began. The special section (*Zoo Challenges: Past, Present and Future*) includes 15 articles that address the historical trends and future aims of zoos in relation to animal management.

The *Conservation Biology* series, published in association with Cambridge University Press, includes internationally significant advances in the science that underpins conservation biology. Titles are based on either symposia held at ZSL or other topics which meet these aims. During 2001 two titles were published: *Carnivore Conservation*, edited by John L. Gittleman, Stephan M. Funk, David Macdonald and Robert K. Wayne, and *Conservation of Exploited Species*, edited by John D. Reynolds, Georgina M. Mace, Kent H. Redford and John G. Robinson.

The Zoological Record, published jointly with BIOSIS, is the oldest continuous information service for the life sciences. As a record of all aspects of zoological research, it is considered the foremost publication in its field. The continued generous support of various institutions, principally the British Library Document Supply Centre at Boston Spa and The Natural History Museum, London, in providing access to material for indexing is gratefully acknowledged.





ZSL's animal collection at London Zoo and Whipsnade Wild Animal Park gives us a wonderful opportunity to interact with visitors of all ages, and to inspire support for our conservation mission. Despite a very difficult year, a number of notable successes were recorded, culminating in Whipsnade being nominated as Zoo of the Year 2002.

Sadly, as elsewhere in this *Review*, it is not possible to write about the work of the zoos without referring to the impact of Foot and Mouth Disease (FMD), which affected all aspects of our work at London and Whipsnade throughout most of 2001. The overall result was a relatively quiet year for the animal collection, but a tremendous response from the staff and support from our visitors enabled us to continue our important work on many fronts. The main objective for all departments was to reduce expenditure to cushion the financial impact, and this was achieved more successfully than could be anticipated, whilst not totally curtailing our activities.

Animals

Many animal moves were not possible through the main period of the disease and even at the end of the year restrictions were still in place, complicating the movement of susceptible species. Staff movement was restricted to avoid direct contact with susceptible species outside the collection, which resulted in the

absence of some staff for several weeks where this was unavoidable.

The major event of the year was the transfer of the three elephants from London Zoo to Whipsnade. The move was not possible until the majority of the new facilities at Whipsnade were completed and these had initially been delayed by FMD restrictions and then by bad weather in the autumn. The result at the end of the year is one of the finest elephant facilities in Europe and a herd of one male and six females for ZSL.

Fortunately, the majority of the significant breeding programmes remained unaffected by FMD precautions. At Whipsnade, births occurred in the Amur tiger, Grevy's zebra, reticulated giraffe, Persian onager and Californian sealion. The year finished on a high with the 50th white rhino birth, a magnificent record. The Bolivian squirrel monkeys gave the best results in the European Endangered Species Programme following changes in the recommended management protocols. First breedings at Whipsnade were seen in smew and Baikal teal, together with other significant hatchings in the sparrow starlings, European eider ducks, white-naped cranes, Stanley cranes and king penguins.

At London Zoo the okapis bred for the first time in 14 years, with the hand-reared female rearing a female calf successfully; they have pride of place on our cover. This was complemented by bongo births and a female sloth bear. Superb tanagers were bred for the first time in the UK at London Zoo together

Above and below: Births at Whipsnade included reticulated giraffe and Amur tigers.

22 Giraffe photo: J R Day





with significant breedings of black-footed penguins and Pope cardinals. By the end of the year the macaw aviary housed three pairs of hyacinthine macaws, and the signs are encouraging that at least one pair will breed.

The Reptile House recorded successful hatching of Kleinman's tortoises as well as snouted cobras, but the problems presented by Ophidian paramyxovirus started to have a real impact. The development of new management protocols for the golden mantella frogs resulted in good success through the year both in *Web of Life* and the Reptile House. Two new species of Barombi Mbo cichlids were bred for the first time and over 250 seahorses bred were sent to aquaria in the USA and Europe. In December the first of full second generation giant weta crickets hatched in addition to significant breeding of the Seychelles scorpion and the Fregate beetles.

Despite the restrictions on moves, both London Zoo and Whipsnade saw new species in the collection including red-billed hornbills and aracaris in Whipsnade and a rather fine Abyssinian ground hornbill at London. New hyacinthine macaws, keel-billed toucans, toco toucans and eastern white pelicans were brought into London to enhance the populations. A female Amur leopard arrived from the USA as part of the programme for this critically endangered species and a new male Hamlyn's monkey was obtained from a very small European population of this enchanting species. A group of feather-tailed gliders were received from

Poznan Zoo as a new species to the Clore Pavilion and big-bellied seahorses as a new species to the seahorse programme.

The Native Species programmes continued well through the year with over 1100 wart biter cricket eggs being handed to English Nature at the end of a ten-year contribution to the Species Recovery Programme. Two new field populations have been established from ZSL stock in this time as well as invaluable data being collected. Breeding of the hazel dormouse at London Zoo enabled Whipsnade to play its part in the reintroduction programme by holding stock from several collections prior to transfer to the reintroduction site. Several hundred Barberry carpet moth larvae from Whipsnade were also used by English Nature as part of that species' reintroduction programme with the aim of establishing new populations in suitable habitat in southern England.

A new Native Species Programme was undertaken in the year with

Above: Female sloth bear cub and mother.

Below: Amur tiger cub.





Above, top: Barberry carpet moth, and tending to them at Whipsnade.

Above: A hazel dormouse, bred at London Zoo.

Opposite: Whipsnade's 50th white rhino calf.

15 corncrakes arriving from quarantine at Chester Zoo as a joint programme with RSPB and English Nature.

London Zoo's role in the International Partulid Programme continues with exceptional results for *Partula tristis*, *P. radiolata*, *P. gibba* and *P. clara* during a year-long husbandry trial to develop the correct protocol for these species. Husbandry guidelines are now underway. The new Partula Species Management System programme was completed allowing a major advance in the studbook elements and other management and analysis considerations for these species. This work in *Web of Life* is linked to the field programme led by Dr Trevor Coote, which this year focused on establishing *Partula* reserves on Tahiti and related survey work as part of development of a regional conservation strategy for the endemic snail fauna. This survey work with the French Polynesian Government was supported by ZSL, Edinburgh and Bristol Zoos. A £10,000 grant was provided by the Biodiversity Trust for the construction of the Tahiti reserves.

Veterinary work

The Wild Animal Health and Welfare Unit is faced with new challenges in zoo medicine every day, but occasionally some unusually demanding cases arise. One such case concerned London Zoo's Minouche, the lowland gorilla, who was sedated in November to determine the cause of a short illness

and found to have an enormous abdominal mass. With the help of surgeons from the Royal Veterinary College she was operated on in December and the 5.5kg mass, an abnormal uterine tract and ovaries, was removed, a particularly difficult operation because of the adhesions between the mass and other tissues. The whole operation took over six hours but she recovered well, only to collapse 45 minutes later, an emergency which required the administration of adrenaline and resuscitation. The mass has subsequently been identified as an endometrioid carcinoma, a tumour arising from her ovaries. Further complications with digital necrosis, and a further operation, followed for Minouche and it was six weeks before she was fully fit but after a long ordeal she is now doing well.

Another demanding case was first seen in September. Steffi, the giraffe at London Zoo, was found to have a fracture of her lower jaw, a condition which required correction under anaesthesia. Anaesthesia is still a high risk procedure for giraffe, but drawing on our experiences of several recent anaesthetics at Whipsnade and using the same team, anaesthesia was successfully carried out. A surgeon from the Royal Veterinary College, who had dealt with similar cases in cattle, wired the jaw back in place and when Steffi was re-examined in December good healing was found to have occurred.





Buildings and exhibits

No major new developments took place at either London Zoo or Whipsnade Wild Animal Park except for the completion of the Whipsnade elephant facilities with the paddock extension and the construction of the Bull House, a major capital investment project.

However, a number of smaller projects were undertaken by staff, continuing the improvements and upgrades to many areas of both sites. In the London Zoo Aquarium we continued the tremendous progress made in recent years both in the public viewing halls and behind the scenes. Old systems have been replaced by new, enabling new species to be brought in including brown bamboo sharks, alligator gar, arowana, arapima and freshwater stingrays. A new Caribbean reef tank was installed with a range of fish and invertebrate species and the old shark tank was finally completed and stocked with lookdowns, grunts and grey trigger-fish.

A new set of amphibian exhibits has been developed in the Reptile House as well as ongoing progress behind the scenes. At Whipsnade three new large owl aviaries were completed using funds raised by the Whipsnade volunteers specifically for this project.

Business

On the business front, 2001 proved very challenging. Precautions against FMD led to the closure of Whipsnade to visitors and restrictions to car entry on re-opening; London Zoo was affected more indirectly, with visitor levels adversely affected by the strong public perception that all animal attractions were either likely to be closed or with severely restricted access. The tragic events on 11 September in New York had a strong negative influence on the tourism market in the south east of England. The combined effect of these external events resulted in visitor numbers at London Zoo falling by 27,000 and Whipsnade by 73,000 compared with the previous year.

These reduced visitor numbers were, however, partly offset by the average spend per visitor in both shops and catering operations being ahead of that achieved in 2000, with a particularly good performance at Whipsnade.

Above: A major capital investment project at Whipsnade – the Bull Elephant House.



The banqueting facilities at London Zoo, managed by Leiths of London, were partly refurbished at the beginning of 2001. What was promising to be a good trading year changed significantly after the events of 11 September. This provoked uncertainty in the corporate world, having the effect of reducing the Christmas party business, a key trading time. Banqueting at Whipsnade was adversely affected by the closure of the Park in the spring; however, business in the latter half of the year improved.

Levels of recruitment to our membership schemes were adversely affected by the lower visitor numbers, with overall growth in line with inflation. The winter membership scheme at Whipsnade continued to be popular.


Marketing activity had to be significantly revised in response to the FMD cost-cutting exercise. However, visitors' awareness of our advertising increased from 17% to 24%.

As the year ended, ZSL received two pieces of good news. London Zoo won a prestigious Zoo Animal Welfare Award for *Web of Life* invertebrate and lower vertebrate care facilities. The Universities Federation for Animal Welfare (UFAW) competition, recognises new initiatives in zoo animal husbandry and housing. In December, Whipsnade was voted 'Zoo of the Year' by the *Good Britain Guide* for 2002. These achievements were particularly pleasing in such a challenging year.



Above: Bongo calf at London Zoo.

Left: David Bellamy presenting the UFAW Zoo Animal Welfare Award.



**ALFA AGGREGATES
PRODUCTS LIMITED**



Powering London



28 **BRITISH SALT**

ZSL has continued to receive tremendous support during 2001 from organisations sympathetic to our work and has prospered by developing closer relationships with current and new donors.

Our activities are funded from a number of sources. Each year many companies choose to help ZSL by sponsoring species and exhibits. This year was no exception, with several new organisations joining our *Animal Partners* scheme including UKCeB, British Gas, BT Cellnet and Alfa Aggregates. In addition to our new sponsors, we have continued to work with our loyal members of the *Animal Partners* scheme such as Yell Ltd, London Power Networks and Nationwide Building Society.

Many of these companies decided to take advantage of our facilities to promote their partnership with ZSL by holding receptions, product launches, family fun days and other similar functions here.

Sponsorship of exhibits and species is not the only way in which companies can contribute towards ZSL's cause. Gifts in kind also help to reduce our operating costs. To this end a number of companies have generously helped by donating products and equipment to all parts of the organisation over the course of the past year, with more under negotiation.

Twinnings Tea has donated herbal fruit infusions to London Zoo's gorillas for several years and continues to support them. British Salt has provided salt for the sealion pool at Whipsnade Wild Animal Park for the past four years.

Two new sponsors, L B Silica Sands and Three Valleys Water helped us to complete the new Bull Elephant facility at Whipsnade by donating sand and special drinking troughs respectively.

Avery Berkel continued to donate weighing scales to numerous sections at Whipsnade and London Zoo. These scales help keepers monitor the growth rates and health of various species, from baby anteaters to snakes. Woolworths has provided us with pressure washers to keep our animals cool in the summer and to help us to keep their enclosures clean.

As detailed in the Education and Information section of this *Review*, The British Land Company PLC sponsored the design and production of *A Good Zoo*, one of a series of educational wallcharts that the company has produced and is circulating to every primary and secondary school in the country.

We are very pleased to announce that Landor Associates, one of the world's leading brand agencies, has been undertaking a critical look at ZSL's brand structure and market positioning. The cover of this *Review* bears the new corporate identity which resulted from this work.

The Mitsubishi Corporation Fund for Europe and Africa has paid the final instalment of its sponsorship of the *Web of Life* website. Mitsubishi has been extremely generous to us in the past and we hope to be able to work together again in the future.

Singapore Tourism Board and Singapore Airlines have kindly sponsored ZSL's prestigious Stamford Raffles Lecture for a number of years and will do so again in 2002, despite the difficulties facing their respective industries in the aftermath of 11 September. We are very grateful for this continued support



We are always looking at new ways in which to increase funds and to reach new supporters and one way of achieving this has been setting up The American Friends of London Zoo as a registered non-profit organisation in the United States. It will enable US taxpayers anywhere to obtain full tax deductibility on their donations to ZSL.

More UK taxpayers can now help us due to the recent changes in the Gift Aid Scheme. We can now recover standard rate income tax (currently 22%) on all donations from UK taxpayers, whether by lump sums or covenanted over a period of years. This means that for every £100 donated, ZSL can recover an extra £28 at no additional cost to the donor. Under certain circumstances, membership and zoo entry fees can also be treated as donations under Gift Aid and this has already given a significant boost to our income.

As ZSL receives help from a great number of sources it would be impossible to thank everyone through these pages. However, your support is much appreciated and we hope to continue working with you in the future.

Major scientific grants

The Institute's core research work is supported by an annual grant from HEFCE. This funding provided a basis for external fundraising, and Institute staff were successful in several competitive research funding competitions. These included:

- Drs Andrew Bourke and Bill Jordan: £271,311 from NERC (Relatedness and information in reproductive conflicts in social groups)
- Dr Christine Muller £49,844 from NERC (The structure of pollinator-parasite interaction webs and habitat modification).
- Dr Guy Cowlshaw NERC 5 year Advanced Fellowship (Dynamics of species extinctions)
- Professor Georgina Mace and Dr Andy Purvis (Imperial College) £172,719 from NERC (Threatening processes and the conservation status of contemporary mammals)
- Dr Bill Jordan and collaborators 297,117 Euros from EU (Impact of aquaculture on the immune response genes in natural salmonid populations)
- Dr Bill Holt and collaborators £405,536 from DEFRA (Identification of genetic indicators of semen freezing susceptibility in boars)
- Dr Andrew Cunningham and RSPB collaborators £148,411 from DETR (Darwin Initiative) (Conservation of critically endangered vultures in India).

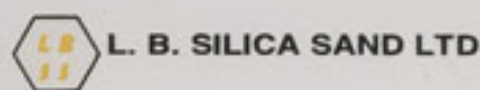
Gift Aid

How you can help us even more

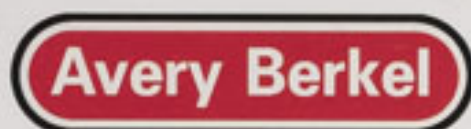
Gift Aid allows you to claim back basic rate income tax on your donation. This means that for every £100 donated, ZSL can recover an extra £28 at no additional cost to the donor.

Thank you for your support

Gift Aid Declaration
I/We hereby declare that the above donation is made to ZSL and that I/We are a UK taxpayer(s) and that the donor is entitled to a refund of tax.



THREE VALLEYS WATER



WOOLWORTHS



THE BRITISH LAND COMPANY PLC
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Landor



Above: Yell held a Meerkat Funday at London Zoo in September with actress Wendy Richard.

This was a busy year for ZSL in the media, with the UK Foot and Mouth Disease outbreak dominating press interest in the early part of the year and issues surrounding elephants towards the end. Conservation science stories also made the headlines with research into elephant communication and disease investigation. Together with animal arrivals, births and other stories, we were never out of the news for long.



New animal arrivals and births throughout the year provided a steady flow of stories and photocalls to help raise our profile and attract visitors through the gates. Notable arrivals and new media stars at London Zoo were Ursula, the female sloth bear cub, a young bongo calf, and Horatio, the Abyssinian ground hornbill, who charmed even the hardest photographers and TV crews with gifts of dandelions through the wire. The photocalls for these animals and the usual hot weather and silly season stories were well attended, resulting in excellent coverage in national and regional press as well as regional TV News.

Whipsnade saw the birth of three beautiful Amur tiger cubs, who made

their press debut being carried by the scruff of their necks by their mother, producing a lovely picture which was featured by the *Daily Express*, *Evening Standard* and local papers. The Park's continued success with breeding white rhinos saw the latest arrival featured in *Hello!*, the *FunDay Times* and local papers.

As well as the planned PR activities, the most was made of unexpected media opportunities. One such event was the sighting of a large spotted cat in a back garden in Golders Green in May. Instead of being the expected well fed domestic moggy, 'The Beast' turned out to be a female European lynx which was captured by the Head Keeper of the Lion Terraces and brought back to London Zoo. 'The Beast of Cricklewood', as she was duly named by the press, caught their imagination and, following a restricted photocall, most of the national newspapers and London's regional TV News ran the story.

The two zoos not only produce a great series of stories and photocalls. London Zoo was used as the location for part of the latest Hugh Grant film *About a Boy* and Whipsnade featured in one of Sainsbury's adverts with 'Naked Chef' Jamie Oliver. Three other large corporates - Vodafone, Harvester Restaurants and Thomas Cook - all used London Zoo as a filming location for their adverts.



The onset of Foot and Mouth Disease (FMD) brought constant media interest about the risks to our endangered species and the precautions being taken. Our website came into its own and was an extremely useful means of communication to potential visitors and the press about the precautions that were in place at Whipsnade and London Zoo. National newspapers covered the implications for the endangered species in ZSL's collection and the financial impact on visitor attractions. TV news crews interviewed ZSL staff, and local media covered the closure and reopening of Whipsnade.

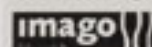
The third series of Imago Production's documentary *Whipsnade* was featured on Anglia TV. The series showed everyday activities at the Park and was well received by viewers. Both zoos were featured in two other programmes produced by Imago: *Wild @ Heart* was a ten part series for Anglia TV and *Adopt a Wild Animal*, an all day programme featuring endangered species, was on Discovery Channel. Both featured ZSL's conservation work and at the end of each programme viewers were encouraged to support these activities by adopting the animals through ZSL's scheme.

In April, *Science* published a paper by Dr Karen McComb of the University of Sussex and Dr Sarah Durant of the Institute of Zoology. The paper explored the role of female elephants as guardians of social knowledge and ZSL hosted the press conference. Radio 4 *Today* programme, *Radio Ulster* and *London Live* interviewed the authors in London Zoo's elephant house and Children's BBC *Newsround* pre-recorded an interview with both scientists for their afternoon programme.

The Institute's UK Marine Mammal Strandings project continued to get regional coverage as cetacean strandings occurred. The local London press was particularly interested in a female bottlenose dolphin that had been swimming in the Thames and stranded on the river bank. The project recently extended its remit to stranded turtles and in May a huge leatherback turtle was brought to ZSL from Cornwall for post-mortem examination. A photocall of ZSL's Veterinary pathologists with the animal was featured in the *Independent* and *Daily Telegraph Magazine* as well as regional press.



Shauna Lowry is filming 'Wild at Heart' for screening on Anglia TV in the New Year.



Above, top: ZSL had its fair share of celebrity visitors with the pop band Hear'Say doing an interview for GMTV at London Zoo. Other visitors during the year included Jon Bon Jovi, David Baddel, Jude Law, Ann Widdecombe and Louis Theroux, who visited either with their families or for location filming.



Left: Following an extremely cold winter, the UK's zoos responded to appeals made by tiger conservationists in Russia and funded the building of crates to transport hungry wild tigers out of villages and back to the forests. The work was covered by national and regional TV and radio.

Photo: WCF



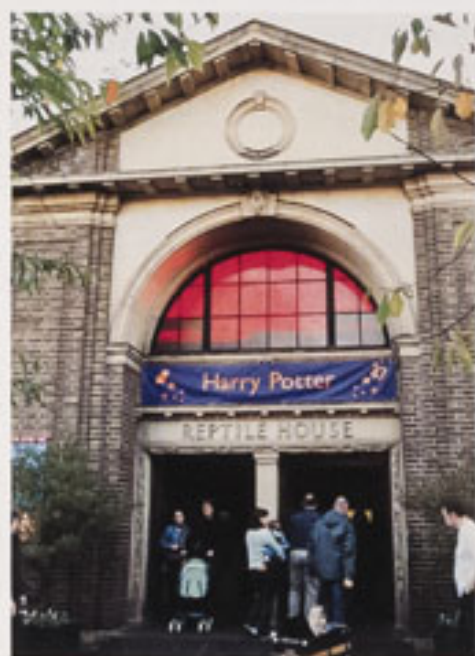
this included London Zoo and we received a lot of coverage and interest as a result.

PR activities supported several fundraising corporate sponsorships, with British Gas holding a national photocall at Whipsnade's penguin pool after donating money for sprays and misters, and Barclays' Private Banking, which carried out a photographic project for a brochure.

The whole year was clouded by the tragic event on 20 October, when Senior Keeper Jim Robson was killed by one of London Zoo's elephants. Within an hour of the incident, reporters and photographers were on site and ZSL issued a series of statements as updates from the hospital were received and, sadly, following his death later that afternoon. There was much speculation in the national media about what had occurred, which individual animal was responsible and about the welfare of London Zoo's elephants. Initially, little information was available and we had to ensure that ZSL was not drawn into debates while official investigations were carried out. The next few months were a time of intense media scrutiny.

A long-term plan to move the elephants to join ZSL's breeding herd at Whipsnade had already been in place. However, Jim's death and the great media interest in the elephants' future brought the announcement of the move forward. On 30 October, a press release was issued explaining ZSL's plans to move the three London elephants. A debate on whether the elephants should move or stay began in the newspapers, with strongly voiced opinions expressed by correspondents.

Once the complex move had occurred, a press release was issued with our own photographs of the operation and these were featured in the national newspapers. Despite great pressure from the press to follow the move it was essential that the welfare of the elephants and the safety of staff were not compromised by outside influences and so access was restricted to zoo staff only. By the end of the year, the elephants were settling well and a press conference was being planned for early 2002, to show the three cows in their new home and to explain how and why they were moved.



Press activity was used to appeal for more information about incidents of garden bird mortality. ZSL's joint research project with UFAW and RSPB, which was highlighted in the *Daily Express* and regional press, has shown a large number of deaths due to infection with salmonella, thought possibly to be associated with large numbers of birds feeding at bird tables. The Vulture Mortality Project also received a great deal of international press interest and this should continue as the project develops.

Harry Potter mania hit London Zoo in the form of 'A Week of Magic' during October half term in the build up to the release of *Harry Potter and the Philosopher's Stone*. The British Tourist Authority produced a Harry Potter map of the UK showing locations where the movie was filmed;

Above: 'A Week of Magic' at London Zoo during October half term.

Our Library continues to maintain its pre-eminence as the largest collection of books and periodicals on the subject of zoology and animal conservation in private ownership in the world, but despite its private nature it is one of the most readily accessible. Much of the material is available for Fellows of ZSL to borrow.

From the beginning of 2001 access has been widened to Friends of London Zoo and Friends of Whipsnade, who are now welcome to use the Library for reference. Previously they had to purchase a separate Reference Ticket to obtain access.



The series of exhibitions about the noted painter of animals, Joseph Wolf (1820-1899), has continued this year with material from our collections being displayed at the National Museum of Natural History in Leiden and the Natural History Museum in London

ZSL's Librarian was interviewed by Nicholas Parsons in a Channel 4 *Collectors' Lot* programme about the work of Edward Lear which featured books and watercolours from our collections. *Under the Zoo* was a series of five radio programmes about the history of ZSL, broadcast on Radio 4 during Easter week. Presented by Chris Packham, it included interviews with staff and Fellows; extensive use was made of our archives and historic books.

Interest in the archives has continued to increase, with a variety of researchers

visiting the Library, mainly to consult the Daily Occurrence books, the 19th-Century Council minutes and Minutes of Scientific Meetings. There has been a stream of historical and genealogical enquiries throughout the year.

The Library staff continued to lend books to Fellows, provide reference use of the Library to members of the public, give introductory tours to new staff, students and Library users; and answer enquiries both zoological and historical. A number of special behind the scenes tours were held for specialist groups including ASLIB Biosciences Group, Friends of the V&A, the Library Association Retired Members Guild and library staff from the University of Portsmouth.

New services in the Reading Room include internet access and online access to a number of journals. Residual circuit devices (RCDs) were installed allowing visitors to plug in their laptops.

As always, we are extremely grateful to our Library volunteers for all their hard work throughout the year and to Fellows, organisations and members of the public who have made donations to the Library.

Through the generosity of the Wolfson Foundation the Library has undergone some redecoration and refurbishment. Although this meant closing for a two-month period, the result is a brighter Reading Room and more pleasant environment for Library users for many years to come.



Above, top: Illustration by Edward Lear.

Above: The Library has undergone redecoration and refurbishment.

Photo: Terry Dennett

Left: Shoebills by Joseph Wolf.

TREASURER'S STATEMENT

ZSL experienced a turbulent and difficult year during 2001. The spread of the Foot and Mouth Disease epidemic over the UK during the early part of the year caused the closure of Whipsnade for two months and a significant fall in visitor numbers at London Zoo. At the time the Trustees' Report for 2000 was being written many zoos in the UK had major cash problems and ZSL itself was under threat of a fundamental review of its viability. To our relief the threat receded and the operations for the remainder of the year returned almost to normal. Cost control measures approved by Council were implemented by management and enabled ZSL to record a surplus for the year in spite of the significant loss of income.

The attached summarised financial statements are based on the format required by the Charity Commission's Statement of Recommended Practice issued in 2000.

The attached summarised financial statements show the overall results of ZSL for the year to 31 December 2001. As the summarised financial statements indicate, the Society recorded a consolidated surplus on operations of £0.9 million and an overall surplus, after charging losses on investments, of £0.4 million. These compare with figures of £3.0 million operating surplus in 2000 and an overall surplus of £2.9 million; however both of these amounts for 2000 included the capital grant for the *Web of Life* building of £2.2 million.

The results for 2001 were severely affected by the loss of gate income arising from the Foot and Mouth Disease epidemic. Whipsnade was closed from mid-February to mid-April 2001, thus missing the popular February half-term and Easter periods, while London Zoo suffered a major decline in visitor numbers in March and April 2001. Overall the shortfall in gate receipts cost the Society approximately £1.0 million of income compared to budget. However, management introduced stringent cost control measures which enabled costs, primarily for permanent and temporary staff and for marketing, to be reduced by over £0.8 million against budget. Encouragingly both zoos' numbers for the period after April 2001 were generally in line with budget and with the previous year, in spite of the decline in tourism generally experienced by other attractions. This, together with higher spends by visitors, unbudgeted legacies and the timing of certain grant income enabled ZSL to record a surplus in a year in which a loss might have been expected.

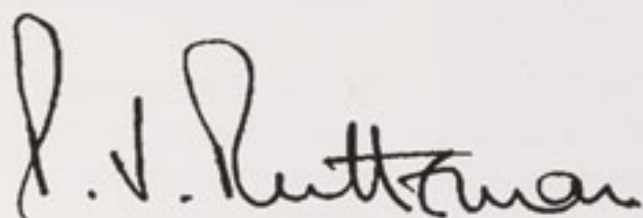
Both the Institute of Zoology and Conservation Programmes recorded better results this year than previously, but their income is effectively ringfenced and in certain cases has been received and recorded in advance of the related expenditure in accordance with the requirements of charity accounting.

Capital expenditure during the year amounted to £1.5 million; the main item was the construction of the elephant facility at Whipsnade, which will house not only the bull elephant but also the three elephants transferred from London at the end of the year. Other capital expenditure has been largely on refurbishment of existing facilities at both sites.

ZSL's balance sheet remains similar to last year. The carrying value of investments has fallen due to the general fall in stock market values resulting in an unrealised loss of £561,000, while debtors increased by £428,000, partly due to gift aid recoveries outstanding.

During the year Purcell, Miller Tritton, a firm of architects and historic building consultants, completed a review of the Regent's Park site. The consultants concluded that, overall, considerable work was needed to restore the site to a 'greener' condition. Their preliminary estimate of costs was approximately £31 million spread over a 20-year period. The situation is currently under review to determine the future content and character of London Zoo and to make plans for development of the capital programme to meet the costs. A similar review is being carried out at Whipsnade where the problems are considerably less onerous.

The continuing support of members and donors is vital for the future development of the zoos and the achievement of ZSL's mission.



Paul Rutteman, FCA
Treasurer

SUMMARISED FINANCIAL STATEMENTS FOR 2001

Consolidated Statement of Financial Activities for the year ended 31 December 2001

	Year to 31.12.01 £000	Year to 31.12.00 £000
Incoming resources		
Incoming resources from operating activities of the charity:		
Activities in furtherance of objects:		
Admission, membership and similar income	9,496	9,561
Publication sales and similar income	389	397
Contract and fee income	517	455
Grants	2,649	4,375
Activities for generating funds:		
Merchandising income and catering	4,000	4,089
Facility fee and rental income	225	210
Other sales and fees	542	480
Donations, legacies and other income	398	525
Interest and investment income	443	482
Total incoming resources	18,659	20,574
Resources expended		
Cost of generating funds:		
Fundraising costs	152	101
Merchandising and catering costs	2,581	2,475
Charitable expenditure:		
Cost of activities in furtherance of objects:		
Animal collection costs	10,512	10,722
Science and research	3,487	3,117
Conservation programmes	639	687
Management and administration	417	475
Total resources expended	17,788	17,577
Operating surplus for the year	871	2,997
Losses on investments	(432)	(126)
Surplus for the year	439	2,871
Total funds balance brought forward	22,668	19,797
Total funds balance carried forward	23,107	22,668

Summarised Cash Flow Statement for the year ended 31 December 2001

	Year to 31.12.01 £000	Year to 31.12.00 £000
Surplus for the year	439	2,871
Add: Depreciation	1,212	1,229
	1,651	4,100
Less: Purchase of Tangible Fixed Assets (Net of Disposals)	(1,712)	(1,307)
Purchase of Fixed Asset Investments (Net of Disposals)	(107)	(939)
	(168)	1,854
Changes in other Assets and Liabilities	71	(725)
Net cash (outflow)/inflow	(97)	1,129

Consolidated Balance Sheet at 31 December 2001

	31.12.01 £000	31.12.00 £000
Fixed Assets		
Tangible Assets	12,982	12,714
Investments	3,232	3,557
	16,214	16,271
Current Assets		
Stocks	378	417
Debtors	1,574	1,146
Cash at Bank and in Hand	7,477	7,574
	9,429	9,137
Creditors: Amounts falling due within one year	(2,189)	(2,219)
Net Current Assets	7,240	6,918
Total Assets Less Current Liabilities	23,454	23,189
Creditors: Amounts falling due after more than one year	(347)	(521)
Net Assets	23,107	22,668
Funds		
Unrestricted – General	17,017	16,496
– Designated	2,502	2,448
Restricted – Endowments	834	842
– Other	2,754	2,882
Total Funds	23,107	22,668

The summarised financial statements are based on the Society's full Trustees' report and financial statements. These summarised financial statements may not contain sufficient information to allow for the full understanding of the financial affairs of the Society. For further information, the full Society's Trustees' report and financial statements, and Ernst & Young LLP's audit report on them which is unqualified, should be consulted. A full set of the Society's Trustees' report and financial statements is obtainable on request from the Finance Director.

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The Zoological Society of London

(Registered Charity no. 208728)

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