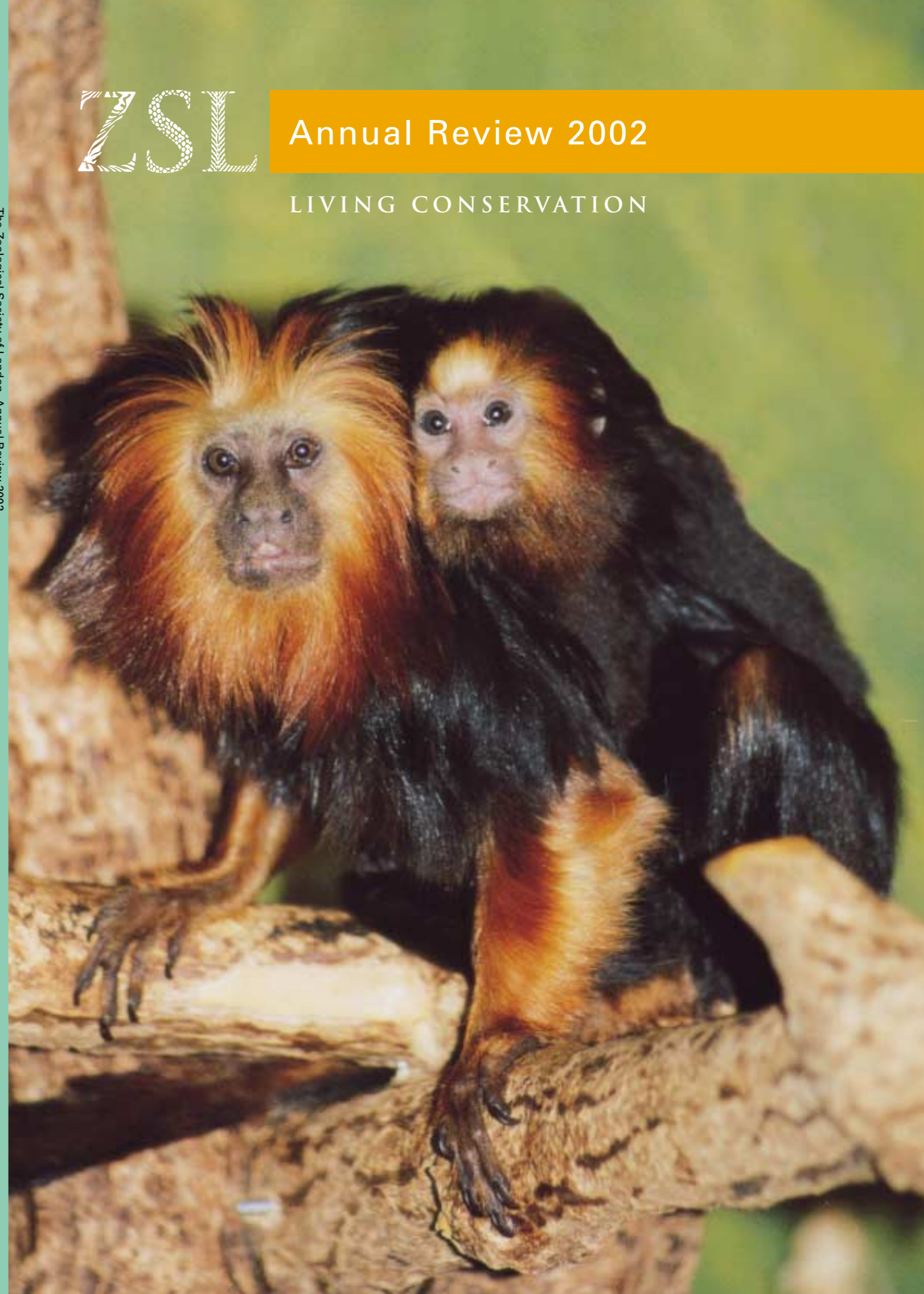




Annual Review 2002

LIVING CONSERVATION

The Zoological Society of London Annual Review 2002



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Front and back cover:
Golden headed lion tamarins
Images: Keith Lloyd/ZSL

Above: ZSL staff worked on a large number of conservation and research projects throughout the world in 2002. Many other collaborations are in development.

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The Zoological Society of London

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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

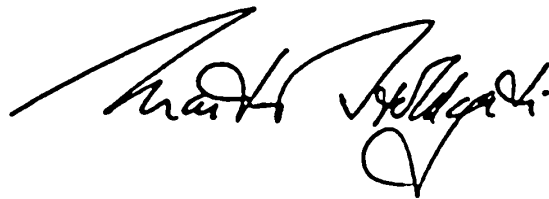
Once again, the Zoological Society of London has had a good year. Yet as each year passes with our accounts resolutely in the black, we need to remind ourselves of the challenges we face, and the need to do more.

We are a body committed to the conservation of animals throughout the world, yet reports from bodies like the World Conservation Union, the World Wide Fund for Nature, the Wildlife Conservation Society and Conservation International are making clear the threats faced by an increasing number of species. ZSL works in the field in a number of countries, and at home we do fundamental research that underpins our conservation effort, but how many Fellows and should-be Fellows know of this work? We host many conferences on animal conservation, but the press and public do not think of ZSL as a conservation body. Should we be more pro-active in promoting both our work and the causes we serve?

Then again, we operate two of the world's great zoos. But this year visitor numbers at Regent's Park have fallen. This may be due, in part, to competition from State-owned and State-supported museums that have ceased to charge for admission. It may also, however, reflect an increasing sophistication among visitors, and a demand to see bigger and better animal exhibits – exhibits where animals live active lives in natural-looking settings, and where visitors can sit in comfortable shelter and watch them. How can we meet such demands, within the constraints of a small city-centre site and with buildings which may be architecturally important but are very different from those we would now construct?

Our strength is in our supporters. Finally, we need to ask ourselves how we may attract more people who love animals and want to be involved in their conservation to become Fellows. The bigger and more committed our Fellowship, the stronger we shall be and the more profound our influence. But to attract people, they must find Fellowship worth-while. We need to get the message that emerges from these pages – that ZSL is a highly active and effective science and conservation body – across to a widening circle of potential supporters.

ZSL has the immense advantage of an expert and highly committed Director General, Directorate and staff, an outstanding set of Officers and Council members, and a number of dedicated volunteers, many of whom are themselves Fellows. I am grateful to all of them for what they have done to create the successes recorded in these pages, and wish all of us at ZSL another highly successful year.



Sir Martin Holdgate
President



Patron: Her Majesty The Queen

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Robert Wingate*

† To 18 June 2002

* From 18 June 2002

Following a difficult 2001, ZSL's fortunes revived considerably during 2002 and, as the Treasurer's report shows, the financial out-turn was an operating surplus of over £1 million. This was the first full year for the current team of Directors and many changes were made that had benefits in 2002, but more significantly will have longer term positive effects. The closer co-ordination of activities across ZSL has led to far higher levels of co-operation than seen previously and the sharing of successes across different parts of the organisation.

Despite the year being one of the wettest of the past century, visitor numbers were well above plan at Whipsnade where there were almost 505,000 visits in total. In the past ten years only 1996 saw higher numbers and Whipsnade had benefited that year from substantial TV coverage in *Animal Hospital on the Hoof*. By contrast, London Zoo suffered along with many other attractions in the capital from the national museum free entry scheme, which was put in place in December 2001. Whilst the Natural History Museum, as an example, reported visitor numbers increasing by more than a million (over 70%), most paid-for attractions in London saw a

downturn. Total visits at London Zoo were 915,000 despite an increase over 2001 of more than 30,000 school visits. This latter increase was the result of the introduction of a new scheme, referred to last year, funded by the Greater London Authority (GLA) whereby schools in the GLA area are offered free entry. This proved very popular and the satisfaction rating assessment by teachers following their visits was excellent.

During the year, efforts to secure Gift Aid declarations from eligible paying visitors were stepped up considerably and the rate of recovery at London Zoo was further improved. Around £600,000 of additional income was generated by these efforts over the year. The introduction of a new admissions system during 2003 is expected to help further in this respect, particularly at Whipsnade where the gate procedures, especially for cars, currently make Gift Aid recovery cumbersome and difficult. Management of our commercial activities on the zoo sites was much improved during the year and this

Below: The three London Zoo females in their new sand paddock at Whipsnade.

4





Left: Improved viewing facilities at London Zoo's lion enclosure.

Below, middle: Birth of a Geoffroy's marmoset was a 'first' for London Zoo.

Below, bottom: A female Przewalski horse was released as part of a reintroduction in Mongolia.

contributed well to significant income growth over 2001. More investment is planned in these areas during 2003, particularly in the management of retail activities.

On the zoo sites, attention was focused on improving facilities for visitors, in particular the viewing of animals for children and wheelchair users. At London Zoo, new glass-fronted screens were installed overlooking the moat in front of the lion enclosure and new wooden platforms were erected inside the enclosure on which the lions choose to lie with obliging frequency. The highlight at Whipsnade was a full season's use of the newly expanded elephant facilities, though this was tinged with sadness when Anna, a great favourite with staff and the public alike, failed to survive a traumatic and difficult birthing complication. Breeding from our elephants remains an objective for the future.

Breeding successes at the zoos were many and are reported on later in this *Annual Review*, but 'firsts' at London Zoo this year included Geoffroy's marmosets, a golden-headed lion tamarin and Kotsovado cichlid fish from Madagascar. Whipsnade continued to make significant contributions with three Grevy's zebras and a pair of hand-reared dwarf mongooses, rejected by their parents, which were subsequently reintroduced into the colony in the Discovery Centre. Conservation breeding remains an important component of the work of the zoos and we were delighted to contribute to a wide range of reintroductions during the year, most notably a female Przewalski

horse from Whipsnade, released as part of a group in Mongolia.

The scientific work of ZSL continued to expand during 2002 with some important new grant awards. The Department of Environment, Food and Rural Affairs (DEFRA) extended its funding of the cetacean stranding project, there were significant new Natural Environment Research Council (NERC) fellowship and studentship awards and grant funding as a whole increased significantly over the prior year.

In addition, our relationship with the University of Cambridge strengthened as the joint committee set up to oversee management of the Institute of Zoology held its first meetings. ZSL Director of Science, Georgina Mace, was elected to Fellowship of the Royal Society. This great honour was not only a personal accolade for Georgina, but also reflects well on the Institute and ZSL as a whole.

During 2002 our conservation work was reorganised into six major themes, and we reassessed our commitment to this important area of our mission. The collaborative way the staff from the zoos and the Institute of Zoology now interact with their colleagues in Conservation Programmes is already bringing positive benefits, and our management of funds expended on field based projects is now being tracked as a total. In 2001 over £2.4 million of funds were applied to projects in the field, a higher figure





Above: Artist's impressions of the proposed new aquarium at Silvertown Quays.

Below: Our work with Project Seahorse continued.

than straightforward management accounting demonstrates, and equivalent to almost 15% of our total expenditure.

Some projects came to an end in 2002, most notable perhaps our contribution to management of the St. Katherine's Protectorate in Sinai, Egypt, but new ones also started. Amongst these are projects with lowland gorillas in Lope National Park in Gabon and with tigers and their prey in an oil palm plantation in Jambi on the island of Sumatra. Our work with Project Seahorse continued and a major achievement, following successful lobbying, was the inclusion of seahorses in Appendix II of the CITES convention. This move ensures that trade in seahorses must be controlled by the setting of quotas and be compatible with their persistence in the wild.

Our Press and Public Relations department was expanded during the year as we tried to become much more proactive in promoting the full breadth of ZSL's activities and successes. As ever, the press focused their attention on photogenic stories from the zoos, such as the Easter coverage of penguin chicks Posh and Becks, but we were able to collaborate on a range of more serious media opportunities relating to our science and conservation work. The Director General was also profiled in the *Financial Times* Under the Skin interview series and was able to promote the very positive changes that are taking place within ZSL.

In May our participation in a project to build a major new aquarium at Silvertown Quays in London's Royal Victoria Dock was announced to the press. This is a very exciting project that will give London a world-class aquarium and involve ZSL in the management of a third visitor attraction. Currently working to a tight timetable for an Easter 2006 opening, the building is being designed by leading architect Sir Terry Farrell and

will be around 11,000 square metres in floor space. There will be four major exhibit areas, as well as a major commitment to promoting the aquatic conservation and science work undertaken by ZSL, together with facilities for formal and informal education. ZSL's Directors have been evaluating the best ways to undertake this project without risk to ZSL's existing assets and Council will be agreeing the definitive way forward during 2003.

Forward planning is taking on ever greater significance for ZSL. During 2002 a new five year strategic and financial plan was produced and attention paid to long-range capital expenditure plans. Our fundraising capability has been rebuilt and we now have substantive plans to raise funds again. At the time of writing, these plans are resulting in large amounts of work on each of the zoo sites for the beginning of the 2003 visitor season, as well as continuing much needed refurbishment of buildings such as the Main Offices.

Throughout the year, Council met regularly to guide the strategic direction of the Society, and was supported by a number of committees. Our trustees and committee members are volunteers, who give of their time freely and generously. The pace and volume of work continues to increase as we move forward. To them, to our dedicated staff and to our numerous volunteers, we owe a great debt of gratitude.

2002 marked something of a turning point for ZSL. Our forward plans are ambitious and achievable, but more importantly are based on credible assumptions. The momentum gathered in 2002 was significant and if maintained in 2003 and beyond will give us the opportunity to report very positively again in future years. I look forward to this eventuality.

**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 2002 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 Michael Patrick Hassell, FRS, of the Imperial College of Science, Technology and Medicine, in recognition of his contribution to our understanding of insect population dynamics.

The Scientific Medal

(awarded to zoologists 40 years of age and under, in recognition of scientific merit)
to Dr Per Erik Ahlberg, of the Natural History Museum, London, for his work in the field of palaeontology and to Professor Laurence Daniel Hurst, of the University of Bath, for his contributions to our understanding of genomic conflict.

The ZSL Marsh Award for Conservation Biology

(for contributions of fundamental science and its application to the conservation of animal species and habitat)
to Professor Callum Roberts, of the University of York, for his 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 Thomas Jones Roberts for his contribution to the understanding of wildlife and conservation in South East Asia.

The Thomas Henry Huxley Award

(for original work submitted as a doctoral thesis)
to Dr Andrea Manica, of the University of Cambridge, for his thesis *Filial cannibalism in a Sergeant damselfish*.

The Prince Philip Prize

(open for competition to pupils, under 19 years of age, of schools or other places of education in the United Kingdom, the Channel Islands or the Isle of Man, on the basis of an account of practical work involving some aspects of animal biology)
to Kate Honeybill of Ryeish Green School, Reading, for her essay *Do gerbils learn?*

Honorary Fellowship

to Professor R McNeill Alexander, CBE, FRS, of the University of Leeds, in recognition of his outstanding contributions to zoological research, for promoting a wider understanding of zoology through his writings, and for his long standing and selfless support of the Zoological Society of London; and to Dr William Conway in recognition of his outstanding contributions to zoology as defined by the mission statement of the Zoological Society of London.

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



Left: 2001 prize winners at the presentation in June 2002.

A Society-wide review of our conservation activities, carried out in 2002, showed the breadth of our work, and gave us an opportunity to organise a more integrated approach. On the basis of our competence and experience, which was shown in this review, six Conservation Programmes have been identified.



Above: The Rt. Hon. Clare Short MP speaks at the Unsustainable Bushmeat Trade conference at ZSL.

Below: Lowland gorilla, Gabon.
Photo: Troy Inman

We now manage our conservation efforts under these themes to foster greater coherence between our research, living collections and fieldwork, and we use them here to report ZSL's conservation successes and applied science achievements over the year, with complementary sections describing the Institute of Zoology's more fundamental scientific work. Further information on our science achievements can be found in the Annual Report of the Institute of Zoology, *Science for Conservation 2001/2* (obtainable on request).

Bushmeat and Forests

Our research programme on bushmeat in West Africa provided input into a major academic debate about the bushmeat trade, through publications emerging from the Society for

Conservation Biology meeting held in July. Similarly, our policy work on bushmeat has focused attention on the links between conservation and development, in particular in a paper presented at a conference, Unsustainable Bushmeat Trade, hosted by ZSL, with guest speaker the Rt. Hon. Clare Short MP, Secretary of State for International Development.

Our field and policy research was also linked with two ongoing campaigns. The European Association of Zoos and Aquaria (EAZA) Bushmeat Campaign has gathered over 1.8 million signatures on a petition to the European Parliament asking them to take action on the unsustainable bushmeat trade. ZSL obtained petition signatures, and worked with partners to develop the campaign. Second, the UK Bushmeat Campaign has raised awareness in the British Government of bushmeat issues in relation to trade and development. Our field work in the Democratic Republic of Congo continued despite difficult political and security situations, and we continued contributing to the UNF/UNESCO Conservation in Crisis programme with UK Darwin Initiative funding. In particular, this involves law enforcement monitoring work in World Heritage Sites, including a ranger training course, and pacification work around Virunga National Park.

An exciting new development this year has been the agreement to work with the EC-funded ECOFAC forest conservation and management programme in central Africa. A specific focus has been on



gorilla eco-tourism at the Mikongo Conservation Centre in the Lope National Park, Gabon. This is one of the few places in Africa where it is possible for tourists to see lowland gorillas, and we are supporting sustainable conservation and tourism.

Carnivores and People

ZSL continues to co-ordinate the tiger and Amur leopard breeding programmes across Europe and Australasia, and in 2002 this role gave us a platform from which to launch a major fund-raising and awareness campaign for tigers, under the banner of EAZA. Money raised by zoos all over Europe and Australasia will support tiger projects in four countries through 21st Century Tiger (a partnership between ZSL and Global Tiger Patrol).



A major ZSL project, and one that will benefit from the EAZA campaign, is the Jambi Tiger Project which is being carried out in conjunction with PT Asiatic Persada, an oil palm plantation company in Sumatra. Here, ZSL is working with plantation and logging company tiger scouts to study tigers and their prey. The teams are already investigating the relationships between land management, pig densities and tiger densities, with a grant from the Save The Tiger Fund. The results will be used to select appropriate areas of the plantation for wildlife conservation, and to develop land management approaches which include wildlife corridors suitable for tigers and other large mammals, such as tapirs.



In Russia, ZSL is now part of an international coalition known as ALTA – the Amur Leopard and Tiger Alliance. ALTA partners share information, work cooperatively and manage more than half of the relevant conservation projects in the Russian Far East. One such project is a joint effort between ZSL and the Anglo-Russian charity AMUR, gathering data on socio-economic factors to supplement existing information on forests, prey species and the big cats. The combined information will guide conservation planning and management.

ZSL is also working in partnership with the IUCN/SSC Cat Specialist Group to produce a database on cat conservation projects world-wide. The existing Global Tiger Projects Database, produced by ZSL in 2001, is being expanded to include other taxa and adapted for use on the web, so that Cat Group members around the world can both contribute and access information; a valuable tool for both conservationists and donor organisations.

In Tanzania, ZSL has a long-term cheetah study in the Serengeti National Park, bounded in part by areas with good populations of both game and large carnivores, which appear to co-exist well with local Maasai communities. In 2002 our research highlighted the potential of the Maasai as conservationists in Tanzania. The results will serve to identify livestock



Above, top: The 21st Century Tiger website was launched in 2002. Visit the website at: www.21stcenturytiger.org

Above: Amur leopard. Photo: Yuri Shibnev

Left: Jambi Tiger Project. The tiger team record tiger pugmarks as well as collecting camera-trap photos. Photo: Chris Carbone/ZSL

management techniques which minimise conflict with large carnivores and can be applied elsewhere.

Building out of this long-term commitment, we are working with the government, the Wildlife Conservation Society, Tanzanian National Parks and the Tanzanian Wildlife Research Institute to produce a National Action Plan for carnivore conservation and to establish a Carnivore Conservation Centre, which will provide extensive training for Tanzanian professionals. This project is funded by a grant from the Darwin Initiative.

Considering carnivore biology in a number of countries, we have studied how different carnivores respond to prey availability. Our analysis shows that despite the great variation in size and habits, carnivore numbers change consistently in relation to their body weight and the quantity of prey needed to support them. We find that, regardless of the species of predator or prey, approximately 10,000kg of prey supports 90kg of predator. Thus, this amount of prey could support 90 individual 1kg mongooses or one 90kg jaguar. Animal abundance is important for understanding the structure of animal communities and for conservation planning.

Deserts and Rangelands

Our field teams continue to work with the National Commission for Wildlife Conservation and Development in the Kingdom of Saudi Arabia, in both the King Khalid Wildlife Research Centre (KKWRC) and the Ibex Reserve at Howtah. Despite several staff changes,

on-going research and management of the captive collections at KKWRC has been supplemented with a series of conference presentations on ibex ecology and genetics, gazelle taxonomy, and papers on veterinary issues.

Monitoring of reintroduced mountain and sand gazelles, as well as ibex and rangeland condition, has continued at two protected areas throughout the year. Standard monthly surveys of ibex and mountain gazelles in the Ibex Reserve have extended for a second full year. This programme is supervised by ZSL/KKWRC staff and has resulted in a substantial increase in ranger training through their involvement in data gathering. The results, reassuringly, show stable core populations for both species. In the western Empty Quarter, we have maintained six-monthly monitoring of the reintroduced sand gazelles, mountain gazelles and rangeland conditions. Our results show evidence that there are now over 1,000 sand gazelles at this site (starting from zero in 1995), while the mountain gazelle population (zero in 1996) has spread over more than 1,000 sq km, making it one of the largest continuous areas occupied by this species in the country.

The main focus in the final year of ZSL's involvement with the St. Katherine's Protectorate project in Sinai has been to complete a visitor centre, and to leave the project under local management for the future. Egyptian professional staff who have gained experience and training through the project have now assumed responsibility for project management. Other key activities have included further developing the Bedouin women's trading

Below: Ibex Reserve survey team.

Below, bottom: Nubian ibex.

Right: King Khalid Wildlife Research Centre, Thumamah, Kingdom of Saudi Arabia.

Photo: Tim Wacher/ZSL





Left: Work has continued to focus on the epidemiology of rinderpest in wildlife populations.

Photo: Richard Kock/ZSL

group, and continuing the biodiversity monitoring, mountain grazing studies, geographic database management, ranger patrol schedules, and community guard development.

A two-year extension of technical assistance to the wildlife-livestock component of the EC-funded Pan-African Programme for the Control of Epizootic Diseases (PACE) was agreed this year. Work has continued to focus on the epidemiology of rinderpest in wildlife populations, to improve the strategy for the eradication of this pest; it appears to have been eradicated from the Uganda-Congo region, but persists in the Somali ecosystem.

Training was provided to support capacity building in nine countries in eastern Africa, including a major workshop in Arusha, Tanzania. This also provided an opportunity to host the inaugural meeting of the Wildlife Disease Association (Africa and Middle East Section), which will help to improve epidemio-surveillance networks and sustain wildlife disease investigation on the continent.

Two other important institutional developments took place. The first was the establishment of a new environment-livestock-wildlife cluster in Nairobi of which ZSL is a part; this group will examine the complex interaction at this interface and its impact on the environment in Africa. Second, ZSL is the co-chair, jointly with WCS in New York, of the newly re-constituted IUCN veterinary specialist group,

(www.iucn-vet.org), with an extensive network in over 40 countries.

Livestock-wildlife interactions also featured in a study of topi antelopes (*Damaliscus lunatus*) in the Maasai Mara National Reserve, Kenya. Among mammals, the habit of mating in aggregations on traditional arenas, or leks, is very rare. We completed a three-year study on topi – one of the few species showing this behaviour – and demonstrated that these leks may evolve for similar reasons in mammals as in birds. The study also highlights potential problems faced by topi in the wild, because lekking behaviour is increasingly under threat from cattle grazing.

We undertook an important evaluation of the Chitwan Wildlife and Domestic Veterinary Programme in Nepal. One year after the project had ended this showed continued success: all four clinics were operating effectively, the proportion of stall-fed, improved livestock breeds had increased, and the number of livestock incursions into the National Park appear to have decreased. This is an excellent example of how conservation and development aims can be brought together.

Over the last decade vultures of the Gyps genus (griffon vultures) have declined by more than 95% across India. Three species have moved on to the IUCN's red data list as critically endangered. In the 1980s, one of these species (the Indian white-backed vulture *Gyps bengalensis*) was regarded as one of the most abundant large birds of



Above: Surveying for turtles in Mozambique.

Below: Project Seahorse: algal cropping in the Philippines.

prey in the world. ZSL, the RSPB and the Bombay Natural History Society are conducting research, funded by a UK Darwin Initiative grant to the Institute of Zoology, to monitor the status of India's vulture populations and investigate the cause of the decline.

Marine and Freshwater

Our Community Fund grant continues to support a significant element of Project Seahorse work in the Philippines. Regional data on seahorse population densities, coral reef habitat, socio-economic factors and the seahorse fishery are currently being analysed to build predictive models that may guide coastal management strategies. In fishing grounds that are extensively damaged by dynamite fishing, large brown algae have overgrown the coral and inhibit regeneration. To address this threat, a low technology approach of algal cropping is now being piloted as a potential reef rehabilitation method.

The new fishers' alliance, KAMADA, was formally established with more than 300 seahorse fishers and government representatives attending the general assembly. The alliance board of trustees were sworn in by the Governor of Bohol, and firm commitments made to protecting the marine resources of Danajon Bank. We recruited a Social Development & Livelihood Co-ordinator to work with our Community Organisers. This team is investigating alternative, ecologically sustainable livelihoods for the rural fishing communities.

The bi-annual monitoring of six community-based Marine Protected Areas (MPAs) continued, and a major analysis of data from the inception of the monitoring project (1998) was

undertaken. Encouraging increases in fish density and coral cover are apparent in those MPAs that are well enforced.

In Mozambique, ZSL continued working with the Cabo Delgado Biodiversity & Tourism Project, where we provided expertise for a three month survey of turtles and dugongs. This involved recording sightings, as well as information gathering through conversations with local fishermen and turtle monitors who were employed to check beaches for signs of nesting. As a result, hawksbill and green turtles are confirmed in the area, and reports of olive, Ridley, loggerhead and leatherback turtles, and dugongs, will be investigated further.

ZSL participated in an expedition to the Rio Negro, Amazonas, Brazil, to carry out a rapid assessment of fish diversity and aquatic habitats. Time was also spent working with staff at the centre for aquatic research and conservation in Barcelos. This initiative is run by Project Piaba, a community-based project aiming to manage and protect floodplain habitats from degradation and to enhance the ornamental fishery, which can provide a sustainable livelihood for rural communities.

UK Native Species

This programme brings together our captive breeding and reintroduction work, London Zoo and Whippsnade site management, and IoZ research. A major step in this integration process was a workshop held to review our UK conservation work. This was attended by our many partners: English Nature, RSPB, University College London, the Natural History Museum and Bedfordshire County Council, and reviewed our Species Recovery Programme (SRP) work, with the aim of recording lessons to be incorporated into English Nature's policies.



Recent successes achieved under the SRP umbrella include the breeding and release of over 4,000 field crickets in West Sussex and Hampshire, and maintaining the over-wintering stock of barberry carpet moths. In addition to these longstanding activities, an exciting new initiative started this year with the breeding of corncrakes at Whipsnade. These were released into the Nene Marshes in Cambridgeshire where corncrakes once existed but have been eliminated.



The veterinary surveillance of wildlife releases under the SRP continues, to ensure that no parasites or diseases are introduced into wild populations. There is still no national coordinated system for monitoring the health of UK's wildlife. Such systems exist in other countries, and we reviewed other schemes to illustrate how a national programme could be developed in the UK.

We have developed models of food depletion to understand the interaction between migratory Brent geese and intertidal green algae on the east coast of England. Since the geese prefer intertidal habitats, and switch to feeding inland only when these are depleted, we were able to predict circumstances when geese will switch to feeding inland. Our model proved extremely good at predicting the timing of switches. Geese cause financial losses to farmers when feeding inland on crops, and the ability to predict the duration and intensity of inland feeding is helpful for developing management solutions.

IoZ's research on bees and bumblebees has informed site management at both London Zoo and Whipsnade. Through a greater understanding of urban bees' ecology, the Wildlife Garden at London Zoo has had new educational materials produced, and at Whipsnade surveys of the chalk downland have shown the area to be important for rare solitary bees.



Island Ecosystems

The most complicated phase of construction of a 'mini-reserve' for *Partula* in Tahiti was completed during the year. The initiative was aimed at protecting the last five surviving partulid species from the extinction threat posed by the introduced predatory snail *Englandina rosea*. This work was funded by the Biodiversity Trust, with contributions from London and Edinburgh Zoos. In addition to these field activities, discussions have been held with the French Polynesian government to develop a coherent conservation programme for these species.

Our policy work continues through participation in the UK Overseas Territories Conservation Forum, which held a number of meetings at ZSL, and we work with these partners to advise and encourage the British government to support conservation action plans in the many islands that fall under UK administration.

Animal health and welfare research

Information on the digestive physiology of giraffes is vital for optimal feeding and management of the species in captivity. High-energy feeds, and diets too high in fibre, can cause a range of ruminant-associated problems. Captive giraffes can also suffer from a condition in which severe depletion of body fat stores occurs. We studied nutrient digestibility in captive giraffes at Whipsnade and the results were used to calculate food intake and energy use, and to provide an optimum diet for the giraffes held in our zoos.

Above: Brent geese.

Photo: Marcus Rowcliffe/ZSL

Left: Corncrakes at Whipsnade.





Above: Institute of Zoology scientists are studying parapoxvirus and its effect on the red squirrel population.

Avian aspergillosis is a widespread, common fungal disease, which in captive birds occurs particularly at times of stress. It is a significant cause of mortality in captive penguins and most outbreaks occur in newly introduced birds, with sporadic cases in established groups. We have developed methods to assess exposure to the fungus, and are working to develop methods for early detection of the clinical disease.

Many cross-species studies have identified social and ecological correlates of parasite abundance and disease prevalence that might influence the evolution of the immune system, and therefore lead to significant differences in the immune response among species. We studied how one component of the immune system varies among primate species. Our findings support the idea that the risk of disease infection from the environment and the risk of injury have played a role in immune system evolution among primates; and indicate that some species may be more compromised by disease as a result of changing habitats and intensive management than others.

The process by which the red squirrel has been replaced in the UK by the alien introduced grey squirrel is not fully understood, but cannot be entirely explained by competition. Our studies of the hypothesis that the disease parapoxvirus affects red squirrels, but is maintained by the unaffected grey squirrel population, suggested that this is a probable contributor to the decline of the native red squirrel.

Underpinning science

Females of many species have become adapted for reproductive strategies that involve some degree of sperm storage. While some species, e.g. bats and some insects, store spermatozoa for months or even years, others store them for a few days. Understanding these natural mechanisms may help the development of better sperm transport and storage media for use in genetic management programmes, whereby spermatozoa could be sent between widely dispersed locations without having to transport the animals themselves. Our detailed studies suggest some complex interactions between sperm and cell surface membranes which we are investigating further.

Semen freezing and storage, coupled with the use of artificial insemination, is increasingly proposed as a strategy for supporting the genetic management of wild animals and rare breeds of domestic species. Organised collections of frozen semen, embryos and oocytes, known collectively as Genetic Resource Banks, (GRBs) are being set up around the world. We have also been developing some of the organisational policies and procedures that are essential for setting up GRBs. Current thinking about these issues was brought together and published with support from a European Commission grant awarded for this purpose.

Non-invasive hormone monitoring is a useful tool for evaluating the reproductive status of individual animals, and can be used to aid decisions by population managers. Although a thorough understanding of the reproductive cycles in the species of interest is required before techniques can be applied, once this has been established, there are interesting possibilities. As a result of our study on the reproductive biology of the Mohor gazelle, efforts can now be focused on individuals that may be of significant genetic value to the population, but limited in their ability to breed naturally.

Observations of wild spotted hyenas suggest that the highest-ranking immigrant males monopolise reproduction in hyena groups, but field observations are rare. We used long-term

field data along with molecular genetic analyses to investigate the distribution of paternity among male hyenas. Our results show that most cubs are sired by immigrant males, and that length of residence is more important than rank. It also seems that female choice may play a more important role in limiting control by dominant males than do power struggles among males.

Despite widespread interest in the evolution of social intelligence, little is known about how wild animals acquire and use information about social companions, or how social knowledge benefits individuals. Elephants, because of their large brains and complicated social systems, are particularly intriguing in this respect. In collaboration with the University of Sussex and the Amboseli Elephant Research Project, we studied how well different families recognised other individuals. Elephants can discriminate between groups but there was great variation between different groups; some were better at discriminating than others. This difference was largely explained by the age of the oldest female, who presumably holds the greatest store of social knowledge. This result has important implications for conservation as well as evolutionary biology. In many mammal societies the oldest individuals are also the largest and these tend to be particular targets of hunters and poachers. If family groups rely on these individuals for their store of social knowledge then

whole populations may be affected by the removal of a few key individuals.

In a wide variety of animal species, females vocalise just before, during or immediately after they mate. These vocalisations, or ‘copulation calls’, are common among primates but not well understood. In a recent study of female copulation calls of yellow baboons in Kenya, we showed that calls from different females were individually distinct, so males could distinguish between them. Females closer to ovulation gave different calls so males may be able to judge how likely it is that a copulation with the caller will result in a successful fertilisation. Finally, calls were longer and more complex during matings with higher ranked males.

Why do life histories and mating systems vary so extensively across bird species? In a research monograph published this year (*Evolutionary Ecology of Birds*), this question was addressed through a systematic analysis of ecological and life history information on some 3,000 species. Variation among ancient avian lineages explains most of the present day variation, and most life history variation is correlated with variation in one ecological trait – nesting habit. The analysis showed how ancient diversification in nesting habit between species can explain much of the vast range of life history diversity seen in living birds.



Left: Yellow baboons in Kenya have been the subject of a study of female copulation calls.
Photo: Stuart Semple/ZSL

Education, in its broadest possible sense, is central to ZSL's mission and covers every area of the Society's activity. We aim to reach a wide range of ages and interests through animal displays, interpretation and exhibitions at our two zoos, interacting with some 1.5 million visitors each year. This year, total school attendances at London Zoo and Whipsnade soared to over 112,000; many London schools benefited from an educational visit made possible through funding by the Greater London Authority. On an international level, our scientific publications and lectures bring ZSL's work to an even wider audience.

Educational programme for schools

This year saw a substantial rise in school visits at London Zoo due to funding by the Greater London Authority encouraged by the Mayor of London, Ken Livingstone. The sponsorship enabled children in London state schools to visit free of charge and, as a consequence, attendance increased by 65% with a total of 82,500 visits during the year. Over 51,700 children visited during the summer term alone.

An evaluation of our educational programme and our service to schools was carried out among over 500 teachers; more than 97% of teachers rated the quality of teaching and the content of our activities excellent or good, with excellent being the highest rating. In addition, funding from Thames Water made possible the welcome addition of an indoor lunch facility for schools.

Educational visits at Whipsnade were also considerably higher than anticipated for 2002 and, for the first time ever, the number of children exceeded 30,000. The school tours and the outreach scheme, which had been introduced in 2001, took off this year and proved to be very popular. Over 1,250 children were taken on guided tours and 1,764 children attended outreach sessions.

After a year's break from the programme, Whipsnade was involved again this year in the local Bedfordshire 'gifted students' work experience programme. In September, four students from two local secondary schools carried out a fortnight's work placement. They were asked to produce a pack for Animal Care students who might wish to use the Park for their studies and the resulting document will act as the basis for a new educational pack. At London, 40 students obtained work experience placements, some as part of the statutory work experience programme in schools, while others used

the experience to support college courses in animal husbandry.

Visitor education

A major development at London Zoo was the introduction of staff known as Explainers. Their role, alongside that of the volunteers, is to enhance the visitor's day out by providing a range of informal talks and activities that are both educational and fun, and to increase the presence of staff on site who are readily available to help visitors. Twelve young people completed a week-long training programme. Among other activities, they were trained to deliver short, lively commentaries on animal behaviour in a move to replace the more traditional talks on the daily event programme. Thus the pelican feed became an exciting drama as pelicans fought off wild herons and gulls to obtain their daily supply of fish while the explainers interpreted what was happening, weaving in information about feeding adaptations and wetland conservation at the same time.

As a member of the European Association of Zoos and Aquaria, ZSL supported the EAZA Rainforest campaign to raise awareness of the conservation needs of lion tamarins and other wildlife in the coastal rainforest of Brazil. At the same time, we successfully raised £18,000 to pay for field assistants and to plant corridors of trees to link fragments of forest, thus allowing the tamarins to meet new mates and increase the population's gene pool. At Whipsnade, a 'rainforest' marquee housed a number of activities, including arts and crafts, story telling and face painting. The presenters of the Birds of the World display team devised an enterprising method of raising money by training Doris, the jackdaw, to collect shiny coins from the audience. At London Zoo, upon the throw of a large dice visitors tied either ribbons or tamarin tags to a cargo net representing a corridor of trees linking two 'fragments of forest'.

A visiting Rainforest Roadshow gave presentations at both London Zoo and Whipsnade on tribal life in the rainforest, as well as demonstrating the use of various artefacts, including an eight foot long blowpipe! A number of rainforest invertebrates were also involved in the presentations.

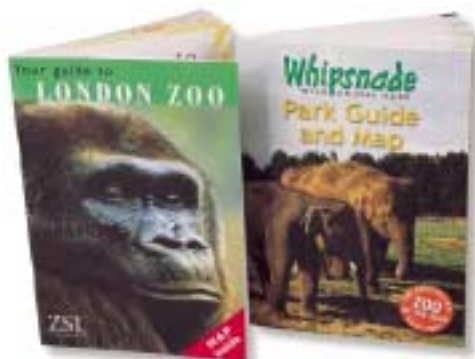


Above: A Rainforest Roadshow at Whipsnade.



Left: Golden lion tamarin.

Two major educational publications, the London Zoo and Whipsnade guidebooks, were both reviewed this year. Besides providing information on the animals in the collection and on how to get the best out of a visit, they highlight the wider work of ZSL, and the back covers portray highlights of a visit to the 'sister' collection. The Whipsnade guidebook was completely re-designed, while at London Zoo, the book was enhanced by case studies of field projects and scientific research.



Below: Interpretation panels at London Zoo highlight Institute of Zoology research.

Facing page: A common dormouse.

On site, at London Zoo, new interpretation panels continued this theme with the production of panels on our research on bumblebees and garden birds, and our conservation programmes involving dormice and tigers. We also produced new panels explaining aspects of animal husbandry to visitors: diets and feeding activities, enclosure design, social grouping and where the animals had come from. Individual animals with strong characters, such as Smoky, the spider monkey, were highlighted in Who's Who panels, and the discovery of the okapi by ZSL Fellow, Sir Harry Johnston, in 1901 was the subject of another panel in the Giraffe House.



Volunteers

Volunteers continue to play an important role in extending the educational role of the zoos. As well as helping to run the EAZA campaign, the Whipsnade volunteer team continued with their own annual fund raising. Helped by a large cheque from Peterborough and St. Margaret's school in Stanmore, they raised enough money to buy an automatic watering system for the plants in the hippo house, as well as additional natural day lighting and extra plants. This will increase the humidity there and, with lush vegetation growing, will enhance the natural atmosphere of the house.

Representing ZSL

Education Officers attended the International Zoo Educators (IZE) conference in Vienna and the British and Irish Zoo Educators conference (BIZE) at Paignton Zoo. For the first time, the IZE conference was combined with conferences for the World Association of Zoos and Aquaria (WAZA) and the Captive Breeding Specialist Group (CBSG).

Qualifications and training

Six keepers from ZSL gained qualified keeper status on completion of the City & Guilds Certificate in Animal Management this summer. Louisa Toner, from Whipsnade, achieved a double distinction and was awarded the Nobby Ashby prize of books.

We continue to run the Master of Science course in Wild Animal Health with the Royal Veterinary College. The course provides veterinarians and other graduates in biological sciences with advanced training in clinical veterinary techniques, epidemiology, diagnosis, prevention and control of wildlife diseases and management of captive and free-living wild animals.

During September, we raised awareness of the conservation needs of sharks with the aid of a life-size model of our native basking shark in the Aquarium. We provided information on the threat to sharks from the trade in fins, and on our plans for a new aquarium in Silvertown Quays. Throughout the summer, a montage of photos of HM The Queen's association with ZSL was displayed in the *Web of Life* to celebrate her Golden Jubilee.

There are now over 100 graduates of the course originating from 35 countries, tackling wildlife disease in all corners of the globe. We are in regular contact with graduates of the course and were particularly pleased to hear that Dr Fernando Gual-Sil has recently been appointed General Director of Zoological Parks in Mexico City and has three zoological collections under his jurisdiction.



Right: Investigating the health of white-backed vultures in Kenya.

Below: A sperm whale. Marine mammal strandings were the subject of a Tuesday Talk.



One component of the MSc course is a research project to tackle some aspect of wild animal health. Two examples from the last course illustrate what can be achieved: Dr Andrew Breed worked in Brisbane, Australia on the detection of hendra virus in flying foxes, *Pteropus spp*, a newly emergent virus which has been linked to human fatality; and Dr Wairimu Gatome travelled to Kenya to investigate the health of white-backed vultures, *Gyps africanus*, closely related to the species in decline in their Asian range.

PhD awards

In the Institute of Zoology, six research students received PhD awards in 2002.

Dr Russell Seymour was awarded his PhD on his thesis *The impact of low level taxonomy on conservation policy. Lekking in topi – a female perspective* was the title of Dr Jakob Bro-Jorgensen's work. Dr David Cope received his PhD for his work on the use of individual-based and depletion models in conservation biology and Dr Susan O'Brien for her work on the harvesting, demography and dynamics of Malagasy chameleon populations. Dr Juliet Dukes was awarded her PhD for her work entitled *The role of gene diversity and regulation of olfactory receptors in the homing behaviour of migratory Atlantic salmon (Salmo salar)*.

Publications and Meetings

An essential part of ZSL's work is facilitating the communication of information between professional zoologists, researchers and the general public. We achieve this through our varied programme of meetings, which are open to the public and members of staff, and the publication of scientific journals and books.

Our 2002 Stamford Raffles Lecture, *The natural history of trilobites*, was given by Professor Richard A Fortey, FRS (Natural History Museum and Oxford University). The event was generously sponsored by the Singapore Tourism Board and Singapore Airlines and we are most grateful for their continuing support.



We hold regular Scientific Meetings on Tuesday evenings. At each, three speakers provide an overview of important research within a particular field. The seven meetings held during 2002 covered a wide range of subjects, such as India's vulture crisis, and sexual selection and speciation.

Tuesday Talks are aimed at a general audience. The subjects covered ranged from marine mammal strandings in the UK to the survival of south China's forest fauna. In October we were delighted to have David Bellamy OBE, FLS, present a talk titled *Stitching the world back into working order*.

In December we held a two-day international symposium, *People and wildlife: conflict or co-existence?* organised by Rosie Woodroffe, Simon Thirgood and Alan Rabinowitz. Speakers gave examples of the impact of endangered species on human livelihoods and discussed possible management solutions to conserve these species; 250 delegates attended.

The Journal of Zoology, ZSL's pre-eminent international journal dedicated to academic zoology, continues to receive increasing numbers of high-quality papers from top researchers. The *Journal* promotes hypothesis-driven studies that are of interest to all readers of zoology, and provides comprehensive coverage of the latest research and developments. During the year, 182 original peer-reviewed articles were published in the 12 monthly parts of Volumes 256–258.

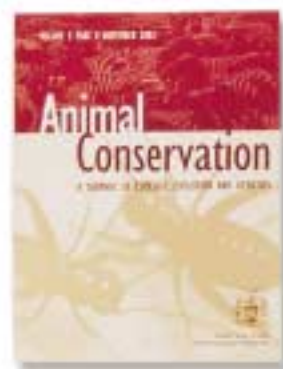
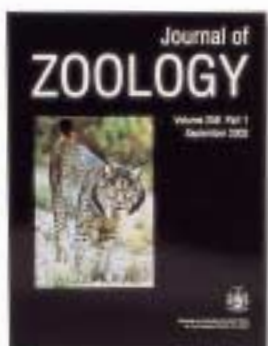
ZSL's quarterly journal, **Animal Conservation**, provides a forum for the rapid publication of rigorous empirical or

theoretical studies relating to species and population biology. The journal brings together innovative research and ideas from evolutionary biology and ecology that contribute to the scientific basis of conservation biology.

The Conservation Biology book 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. A new title, *Conserving Bird Biodiversity*, edited by Ken Norris and Deborah Pain, was published.

Production of Volume 38 of the **International Zoo Yearbook** continued. 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. Articles in Section 2, *The Developing Zoo World*, range from the artificial insemination of koalas to the development of a computerised avian and veterinary record system.

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.





Successful breeding, participation in international programmes, and the development of on-show and off-show animal facilities were all features of the past twelve months. Together with planning for new commercial systems for introduction in 2003 and many improvements in the appearance of the zoos and visitor facilities, 2002 was a year of consolidation and progress.

Above: A giant anteater was born at London Zoo.

Below: An anoa.

Below, right: The Casson Pavilion became home to the anoa.

Right, top: A Kotsovado cichlid.

Right, middle: The Aquarium's conservation breeding room.

Right, bottom: Black Barombi Mbo and striped Barombi Mbo cichlids.

Animals

The year was one of the most challenging in the history of elephants in ZSL, following the transfer of the three females from London Zoo to Whipsnade at the end of 2001. The excellent new facilities enabled the integration of all the individuals in various combinations. By the end of the year the various compatibility issues were still a challenge; however Azizah had been mated by Emmett so the signs are encouraging. The year was marred by the death of Anna following complications from a retained foetus.

ZSL played a significant role in the development of husbandry guidelines for elephants which were published by The Federation of Zoos and will set standards on the future care of elephants in the UK and possibly other European zoos.

The challenge of finding suitable replacement species in the Casson Pavilion (the old Elephant House) at London Zoo was exacerbated by the departure of Jos, the male black rhino. This presented the opportunity to give the anoa a better space and they appreciated this through the summer;



with the Bactrian camels and pygmy hippo, the Casson Pavilion still provided a worthwhile area for our visitors.

There were a number of significant mammal births on both sites through the year including three Grevy's zebra and another sealion at Whipsnade; births at London Zoo included a giant anteater, pottos, Geoffroy's marmosets and a golden headed lion tamarin, the latter two species being firsts for London Zoo. At Whipsnade, the dwarf mongoose colony continue to reject their youngsters; this time two neonates were rescued and hand-reared, and both have been successfully reintegrated with the group.

The old male greater Asian one-horned rhino, Kumar, died leaving a number of successfully breeding offspring and a possibly pregnant grand-daughter in European zoos. Efforts have been underway for some time to find a new male to join the two young females but, as yet, this has not been achieved.

The Bird Department achieved a first UK breeding of black-necked aracari. This was eventually achieved by taking one of the two chicks for hand-rearing using a puppet as a surrogate parent-bird. Other significant breedings included black hornbill, corncrakes, king penguins, smew and hood mergansers. Harris hawks and grey parrots, bred at Whipsnade, but which had to be hand-reared, successfully joined the birds in the flying demonstrations. The endangered Mindanao bleeding heart dove reared a chick for the first time at London Zoo and it was satisfying to see the scarlet ibis rear a chick for the first time for several years.

The arrival of two pairs of Montserrat orioles was probably the most exciting species acquisition of the year. Successful breeding at Jersey Zoo meant they were looking for partners to expand the captive programme following the emergency rescue of a number of specimens after the volcano eruption on the island of Montserrat.

The Aquarium staff managed to maintain their record of successes despite the distraction of assisting with the development of the new aquarium to be based at Silvertown Quays. This year first





Above: Sealion pup born at Whipsnade.

breedings included the Kotsovado cichlid from Madagascar, the Lake Kutubu rainbow fish and the short-snouted seahorse. Other significant breedings included the pot-bellied seahorse, black Barombi Mbo and striped Barombi Mbo cichlids, the Otjikoto tilapia and the crescent zoe.

Web of Life bred the giant rhino cockroach as a first breeding outside Australia and saw giant Weta crickets bred through to second generation. The carpet barberry moth programme at Whipsnade continued its success and provided a number of larvae for reintroduction, although there are still problems on occasions with predation. The field cricket provided a pair of invertebrate reintroductions as part of the English Nature Programme with 3,149 nymphs successfully released in four sites. Dormice and corncrakes bred by ZSL also joined English Nature's reintroduction programmes, the latter in partnership with the RSPB. This was an initial trial release following successful breeding through the year. The corncrakes proved to be quite a challenge but after a roller-coaster year

many of the problems seem to have been resolved and we look forward to 2003 with optimism that we can meet the challenges of rearing a significant number of birds for release.

Whipsnade undertook several more challenging animal transfers including an exchange of male giraffe with Brno Zoo in the Czech Republic, the export of a white rhino and the import of a male gaur. The Aquarium acquired a variety of new species, of which the critically endangered, and possibly extinct in the wild, Madagascan *Ptychochromis mandritsara* was the most significant.

With over 100 births of the Przewalski horse at Whipsnade it was entirely appropriate that a young female joined the herd from European zoos in Switzerland prior to the transfer to Mongolia as part of the reintroduction programme. This was a significant achievement and ZSL is delighted to be involved following many years leading to this stage of the programme.

Another international zoo effort developed after a huge number of Asian

freshwater terrapins were confiscated by the Hong Kong authorities. ZSL played its part by taking specimens from three species initially at Whipsnade, but later moving some to London Zoo. The specimens arriving in European and American zoos could be significant founders for captive programmes for several critically endangered species, for a group of animals that are under serious pressure in the wild.

As well as participation in individual species programmes or the work in Taxon Advisory Groups, ZSL has maintained its support of several conservation programmes. Project Seahorse is an outstanding example of this, and reward for incredible work by the team was achieved when CITES recognised all seahorse species.

Staff participated in a five-day workshop and site surveys in Kenya as part of the black rhino programme there. Funds have been given to the Ngulia Rhino Sanctuary to support costs for an essential piped water system.

A small reserve was established on Tahiti during two separate field trips to the island to protect the last five surviving species of Partulid snails in the Society Islands. This project was made possible by a grant from the Biodiversity Trust, with additional funding by Edinburgh, Bristol and London Zoos.

ZSL also supported: the Epulu Project in the Democratic Republic of the Congo, and their work on okapi with funds raised by the keeping staff; the Madagascar Fauna Group (an international zoo consortium);

visits to provide expertise at Kabul Zoo; and a tiger and bear project in the Russian Far East.

ZSL was awarded four Federation of Zoos Awards this year for its Project Seahorse programme; seahorse and Fregate beetle breeding programmes and for the development of the *Partula* snail Species Management System – a computerised group management database designed to allow data entry and analysis to be carried out at institution level – the first such studbook to do so. The Fregate beetle breeding programme (coordinated by ZSL) has been made a formal EEP programme which is being managed by London Zoo.

Nine Friendly Spider Programme arachnophobia treatment sessions were successfully conducted during the course of the year.

Buildings and exhibits

Although no major developments were seen on either site, a number of small projects were undertaken through the year including the construction of a new aviary near the Main Gate to house a busy colony of village weavers which proved extremely popular to London Zoo visitors. Three Island Pond underwent some improvements to set the area up better for both flamingos and pelicans for breeding in the future.

The lion and tiger enclosures underwent some new landscape work, the old rhino paddocks were prepared for, initially, anoa, and for the bearded pigs in the future, and many improvements were seen in the



Above: Fregate beetle.

Below: A colony of weaver birds greets London Zoo visitors as soon as they enter the Main Gate.





Above: A radio-collared black-backed jackal among sleeping seals.

Photo: Gracia Vila

Right: Veterinary check for one of the confiscated Asian terrapins.

Aquarium, both to the exhibits and some of the off-show areas, particularly with improvements to the life support systems. Two new outside cages were constructed for tamarins and marmosets at the Clore Pavilion which is a significant improvement in the management of these small primates.

Veterinary work

The veterinary department, based on both sites, is undergoing a detailed review under our new Head of Veterinary Services which will set the direction for the future. One area for growth is the support for on-going ZSL field projects. In November, one of our veterinary officers travelled to Namibia to provide veterinary expertise for the black-backed jackal project, run by the Institute of

Zoology. Veterinarians continue to collaborate with English Nature on the health surveillance of several managed species, including common dormice, red kites, British field crickets and corncrakes.

At the zoos, we continue to be very busy treating collection animals and performing numbers of post mortems and other diagnostic tests in the zoo laboratory. There has been a considerable increase in veterinary involvement in the Aquarium through diagnostic work-ups, treatments and post mortems. ZSL collaborated with many zoos from Europe in rehabilitating several Asian terrapins which were confiscated by customs personnel in Hong Kong.

Clinical staff have been involved in many high profile procedures requiring considerable planning. Often procedures would require expert help from local veterinary colleges and specialists. One such case involved the Indian rhinoceros, Roopa, who has been treated for a chronic foot condition on several occasions.



Business

There was significant reorganisation of the commercial functions during the year. This focussed on identifying the benefits of closer commercial management across the London Zoo and Whipsnade sites and the strengthening of management systems. Improvements in commercial performance were seen during the year and the foundations have been laid to enable these improvements to continue.

The visitor attraction market in London continues to be highly competitive. Events in the latter part of 2001, itself a poor year due to Foot and Mouth Disease, had significant impact in 2002. The aftermath of the events of 11th September 2001 in New York continued to see a depression in foreign tourists to London, particularly from the United States. This prompted increased competition amongst visitor attractions for domestic visitors. The Government's sponsoring of the National Museums to open free of charge from December 2001 also greatly sharpened the competition from this sector. As a result, visitors to London Zoo declined by 16,000 compared with 2001. Whipsnade was unaffected by these competitive pressures and had an excellent year for visitors. Total visitors were 107,000 ahead of 2001, during which the Park was closed for several weeks due to the Foot and Mouth Disease epidemic.

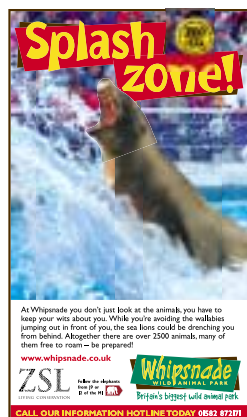
Our marketing activity was stepped up in 2002. The London Zoo advertising campaign saw visitor awareness of our advertising dramatically improve from 27% to 46%. The Whipsnade campaign focussed on local press and radio. A continuous market research survey commenced at both sites. This will give

key information on measuring visitor satisfaction and information on how it can be further improved. The Marketing Department was centralised at Regent's Park and the agency roster re-tendered.

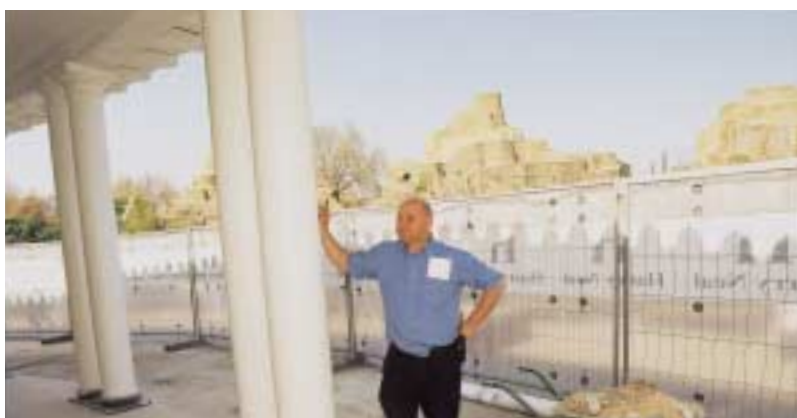
Retail and Admissions across both sites have now been combined into one management structure. The retail performance of both sites saw improvements both in average spend per paying visitor and in overall trading margins. A new retail system (EPOS) has been identified and will be commissioned during February 2003; this will bring major business benefits in 2003 and beyond. The improvement in Gift Aid reclamation at the admission gates has been an important contributor to our financial performance in 2002. A new admission and ticketing system has also been identified and will be commissioned in spring 2003. This will bring major improvements in efficiency and customer service.

Day visitor catering saw improvements in average spend per paying visitor on both sites, with a particularly strong performance at Whipsnade, where a new management structure has been put in place. The Cloisters function suites at Whipsnade were partially refurbished and the business showed continued growth. The functions business at London Zoo, managed by Leith's, had a disappointing year. This was due to a recession in the London corporate functions market. A strategic review, with the assistance of outside consultants, of ZSL's total food service business was completed. The recommendations of this review will influence the future management of these important businesses.

Below: Whipsnade's advertising campaign.



A more integrated approach to fundraising has been adopted in order to provide long-term and sustainable support for all of the Society's mission areas: collections, conservation programmes and research. The change in management structure introduced during the previous year has made this approach possible and the rebranding of ZSL further supports the cross-functional message for fundraising.



Above: Renovation of the Mappin Café.

Below: Shloer funded the redevelopment of Three Island Pond.

British Land continues to support ZSL following its sponsorship in 2001 of an educational wallchart for schools. This year, the company made a very generous donation towards the renovation of the Mappin Café at London Zoo. Added to a grant from English Heritage, this means that this Grade II listed building can be removed from the Buildings at Risk Register. Work began in the August for completion in spring 2003.

Three Island Pond is possibly one of the few surviving original landscape features at London Zoo. Sponsorship from soft drinks company **Shloer** funded the redevelopment of the enclosure and creation of flamingo nesting areas. The redesigned exhibit, featuring greater flamingos and pelicans, communicates the importance of preserving European Wetlands and gives visitors a chance to marvel at these beautiful birds.

Thames Water continues its partnership with ZSL. Their support has contributed to the refurbishment of part of the old Parrot House at London Zoo as a bright new lunch room for schools. This Thames Water Waterhole was ready for use before the end of the year and is much appreciated by children and teachers alike.

The company has also funded the redesign of the Water Efficient Garden, originally sponsored in 1997; it is situated next to the Mappin Café on the south side of the Zoo. Garden designer Simon White was commissioned to look at ways of enhancing the garden whilst maintaining the basic components of the original design.

The imaginative improvements proposed by Simon have been turned into reality by a team from Berkshire College of Agriculture, led by David Penny. The garden now also boasts a custom-made sundial by David Harber.





Above: Thames Water's Water Efficient Garden.

Fundraising for ZSL can be both large-scale and small. This year, volunteers at Whipsnade undertook to raise money to buy a new sprinkler system for the hippos in the Park. Their activities were supported by the concerted efforts of children from Peterborough & St. Margaret's School, Stanmore. Together they achieved the goal of providing the hippos with a much-needed cooling system for the summer months.

Membership

Those supporting ZSL through its membership and animal adoptions programmes totalled 21,140 during the year. The Society also enjoyed the support of 2,200 Fellows. Members of ZSL's Friends organisations at London Zoo and Whipsnade Wild Animal Park contribute not only through their annual subscriptions but also through their regular visits to the two sites and attendance at special events. A first for 2002 was a 'behind the scenes' tour of the Great Whipsnade Railway, which was very popular with steam enthusiasts. Other popular events included an open evening and barbecue at Whipsnade and Halloween evenings at both London Zoo and the Park.

Whipsnade replaced its Season Ticket with an Annual Pass to run alongside the Friends scheme. The Annual Pass simply allows unlimited admission during the year whereas Friends membership offers the chance to become more involved and take advantage of a range of benefits. A membership kiosk was also opened at the main entrance to offer a more direct service to Friends on site.

Major grants

The Institute of Zoology's core research continues to be supported by an annual HEFCE grant.

The £1.8 million received in 2002, via the University of Cambridge, provided a sound basis for the growth and development of the research programme. Research staff were also successful in applications for competitive grants and studentships.

Grants awarded include:

- **The Natural Environment Research Council** funded two new PhD studentships (supervised by Dr Andrew Bourke), £156,053 towards a three year project *Global biodiversity hotspots: evolution, ecology and extinction* (Dr Peter Bennett) and a two year project *Development and implementation of a spatially-explicit model of the 2002 phocine distemper epizootic* (Professor Georgina Mace) in collaboration with Cambridge University and the University of St. Andrews.
- **Darwin Initiative** grants were awarded (Dr Stephan Funk) *Conserving the critically endangered Darwin's fox on Chiloe Island, Chile* (£158,006) and (Dr Sarah Durant) *A national plan for carnivore conservation in Africa* (£193,080).
- **The Wellcome Trust** awarded a three-year Biodiversity Training Fellowship to Dr Mathew Fisher (£189,754) *The population genetics and epidemiology of an emerging infectious disease*.
- **English Nature** contributed £31,363 to the Species Recovery Programme (Tony Sainsbury).
- **DEFRA** contributed £261,461 to *Investigation of a PDV Epizootic in the UK during 2002* (Dr Andrew Cunningham), and £570,000 *Increasing the efficiency of artificial insemination: improving sperm survival by oviduct components* (Dr Bill Holt).
- **The John S Cohen Foundation** awarded a grant to fund the second phase of the Institute of Zoology's vole project. The project studies the use of voles as biomarkers or sentinels for the detection of endocrine-disrupting chemicals in the environment. It is being run jointly with the BBSRC Silsoe Institute, Kings College London and Queen Mary & Westfield College.

Grants awarded to ZSL's conservation programmes include:

- **The Community Fund** contributed £115,659 to *Project Seahorse* (Dr Heather Hall) to support Socio-economic research and Fisheries modelling in the Philippines.
- **The European Union** contributed £81,811 to the *Pan-African project for the Control of Epizootics* (PACE, Dr Richard Kock), and £59,688 to the St. Katherine Protectorate Development Programme, South Sinai, Egypt (Dr John Grainger).
- **The Royal Geographic Society Ralph Brown Expedition Award** provided a grant of £15,000 for *Wildlife Conservation with Special Reference to Fish Resources and Biodiversity Studies* in the Babai River Valley, Royal Bardia National Park, Nepal (Colonel Mike Allen/Alice Courage).
- **The National Fish and Wildlife Foundation** (USA) awarded £27,670 via the Save the Tiger Fund to support conservation monitoring of the Sumatran tiger (Sarah Christie), and £9,500 to support the marine programme of the *Cabo Delgado Biodiversity Project* in Mozambique (Dr Julie Garnier).
- **Tusk Trust** also contributed £5,000 to the Cabo Delgado project.
- **The US Fish and Wildlife Service** contributed £36,800 to the *Elephant Patrol Monitoring Programme for Virunga National Park*, Democratic Republic of Congo (Dr Emmanuel deMerode).
- **DEFRA** awarded £40,000 to ZSL via the Swiss research organisation KORA, to support the work of 21st Century Tiger and other ZSL big cat projects (Sarah Christie).
- **Mrs Ann and Mr Bill Elfers** donated £13,500 to support tiger and leopard conservation in Russia and Indonesia.
- **The Bosack and Kruger Foundation (through Cat Action Treasury)** awarded \$18,700 for the IUCN Cat Specialist Group Cat Conservation Projects Database, which is being produced and managed by ZSL (Sarah Christie).

Communicating ZSL's work through the media allows us to explain the breadth of our activities to a vast audience. With our experts' opinions being sought for comment on a variety of conservation and animal-specific topics, ZSL continues to be seen as a source of reliable and authoritative information.

Right: Turner Prize winner, Chris Ofili, generously supported our elephant work by selling one of his paintings.

Below: Penguin chicks, Posh and Becks.



Following the move of London Zoo's three female elephants to Whipsnade at the end of 2001, the new year's PR activity started with a press conference and photocall to show the elephants progress in their new home. Answering questions from the national papers, local press and TV, the Director General, Zoological Director and Senior Curator explained the reasons for moving the elephants, the move itself and our plans for the elephant herd in the future. Pictures of the elephants enjoying their extensive facilities in the company of their new companions appeared alongside articles about the move, and interviews were featured on regional TV.

Elephants continued to feature in our PR activity throughout the year. In February, the artist and Turner Prize winner, Chris Ofili, sold one of his paintings and kindly donated the money to our elephants who, over the years, have provided him with the raw

material (dung) for his paintings! Chris joined the elephants on Whipsnade's Downs for a photocall, which was featured by seven national newspapers and *The New York Times* as well as regional press.

In March, the inquest into ZSL elephant keeper Jim Robson's death resulted in coverage in most national newspapers and regional TV news. This rekindled the media debate on how elephants are managed in zoos. Later in the year, the ZSL PR Office worked with the zoo community to launch The Federation of Zoological Gardens of Great Britain and Ireland elephant management guidelines. *The Independent* ran a comprehensive piece, explaining the measures being taken to maintain good animal welfare and to assist in the conservation of the species. These guidelines were followed swiftly by an RSPCA report criticising zoos for keeping elephants. Together with our colleagues from the Federation, we



co-ordinated interviews, fielded enquiries and challenged mis-information. Chris West, ZSL's Zoological Director, acted as spokesperson for the Federation, in his capacity as Chair of the Elephant Group. Live debates were held on *GMTV* and *Newsround*, and interviews were featured in national and regional newspapers and on radio.

With the onset of spring, exciting animal births came thick and fast with regional press featuring Whipsnade's 50th white rhino calf, several Grevy zebra foals, a sealion pup and chameleon hatchlings. WWAP's hand-reared dwarf mongoose made it into *OK!* and the young West African dwarf crocodiles featured in *The Mirror*. Elvis, the latest addition to Whipsnade's chimp group, was a hit with the local papers, proving he was king of the swingers, and this also enabled us to announce ZSL's plans for a new chimp house at the Park.

At London Zoo, the great achievement of breeding an okapi calf was featured by *The Sunday Times* and the regional press. The latest giant anteater youngster, a pair of Geoffroy's marmoset babies and a scarlet ibis, hand-reared using a puppet, caught the imagination of the *Evening Standard* and regional papers. However, it was the power of celebrity and world cup fever that resulted in extensive coverage for two of our penguin chicks at Easter. Their keeper, a football fan, named them Posh and Becks, and the inevitable crowd of photographers turned up for their photocall. We are now just waiting for the arrival of Brooklyn and Romeo!

Our two feathered celebrities were not the only ones to arrive at the Zoo. Brad Pitt, Cate Blanchett and friends enjoyed a visit despite a tenacious paparazzi photographer, whose pictures were featured in *Hello!* magazine. Actress Angelina Jolie brought her son to the Zoo while visiting London. Davina McCall caught up with her adopted gorillas and filmed an interview with Dermot O'Leary. The Rt. Hon. Ann Widdecombe MP made her second visit to the Zoo for the summer open evening, this time accompanied by her mother. Whipsnade also received some celebrity attention when actress Imelda Staunton washed the elephants for 'Star Challenge' in *The Mirror Mag.*

A discussion piece in the *Financial Times* with the Director General, Dr Michael Dixon, reflected the work he does as head of the organisation and highlighted our plans. Dr Dixon and his Personal Assistant, Diane Bratby, were also interviewed and photographed for *The Times* secretarial section for a feature about their work together.

ZSL's scientists' activities were featured in the media with Professor Georgina Mace's election to Fellowship of the Royal Society being featured in the *Financial Times* and *The Times*. Dr Andrew Cunningham's work with the Frog Mortality Group appeared in national and regional papers following an article by the Froglife Trust in *BBC Wildlife* magazine. Dr Chris Carbone was interviewed by Radio 4's science programme *Leading Edge* about his paper published in *Science* on a rule for scaling predator density. The paper was also featured in *BBC Wildlife*.

The Marine Mammals Stranding Project received much media interest as a result of large numbers of cetacean strandings and the outbreak of phocine distemper virus (PDV) in the UK seal population. ZSL's Paul Jepson was interviewed by BBC TV's *Country File* about the serious issue of marine mammal deaths as a result of bycatch. Paul and his team co-ordinated the research into the latest outbreak of PDV in the seal populations around the UK coast. ZSL assisted by putting out a call for volunteers to help walk 1km of local coast regularly to count the number of dead seals. This story was run by regional papers and Paul Jepson was interviewed by BBC Radio 4



Above: Dermot O'Leary and Davina McCall at London Zoo.

Below: Robert Evans MEP (left) and Barry Gardiner MP at The Unsustainable Bushmeat Trade conference.



Today programme and many regional radio stations around the coast of England.

BBC Radio 4 recorded a half-hour programme on London Zoo for a series called *Sense of Place* which aimed to capture what is special about well-known locations in the UK. A great variety of people working or associated with the Zoo were interviewed for this critically acclaimed programme.

In February, Barry Gardiner MP, the member for Brent North, and Robert Evans MEP launched The UK Bushmeat Campaign at Westminster. To coincide with this launch and to highlight ZSL's involvement in the Campaign, a photocall for the Zoo's new male gorilla, Jock, was held on the same day. Barry Gardiner and ZSL's Conservation Programmes Director, were interviewed by regional TV news, and the campaign and story was run by the *Evening Standard*, *The Independent* and the regional press. Later on in the year, ZSL hosted a bushmeat symposium which was attended by the

Rt. Hon. Clare Short MP and was covered by regional TV news.

A Przewalski's horse was sent from Whipsnade to Tachyntal in Mongolia to be part of a herd of horses re-introduced into the species' original habitat. The *Guardian Weekend* magazine, *BBC Wildlife* and local papers followed the horse's journey.

Another re-introduction, this time in the UK, was featured in *The Daily Telegraph* and several local papers. London Zoo released 3,500 zoo-bred British field crickets into Hampshire and Surrey as part of English Nature's Species Recovery Programme.

On 20 May, ZSL and The Mayor of London, Ken Livingstone, launched the project for a new, world-class aquarium for London. An evening function was held. Papers local to the new site as well as trade press ran stories and *The Times* featured a cartoon of the event by Martin Rowson. *The Sunday Times* ran a comprehensive piece about the project the following week.

Below: The launch of the Silvertown aquarium project was recorded for posterity by cartoonist, Martin Rowson.

Photo: Reproduced in *The Times*.
Copyright Martin Rowson.



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. Over 600 books and 4,000 serial issues have been added to our collections, many of these being received through the generosity of members.

The Library re-opened in January following some redecoration and refurbishment, which was carried out through the generosity of the Wolfson Foundation.

Under the Zoo, a series of five radio programmes about the history of ZSL, was broadcast again on Radio 4 during February. The programmes were presented by Chris Packham and included interviews with staff and Fellows; extensive use was made of archives and historic books.

During the year our loans system was computerised and the number of loans to Fellows increased to six items at any one time; this greatly enhances our service to members.



Details of almost all the pre-1860 books have been added to the computerised catalogue and this now contains almost 12,000 book records. It can be searched in the Reading Room by Library visitors.

Interest in ZSL's 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, minutes of Scientific Meetings and the correspondence collection. A start has been made in adding these to our computerised catalogue. Again, there has been a steady stream of historical and genealogical enquiries throughout the year.

The Library continues to provide reference use of the Library to members of Friends of London Zoo, Friends of Whipsnade and 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, Animal Health Information Specialists (UK & Ireland) and library staff from the University of London.

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. We are also grateful to the Fellow who donated funds for the purchase of a specialist book photocopier which reduces the damage caused to books when they are copied.



Above: Chris Packham's radio series on ZSL's history was broadcast in 2002.

Photo: Arlington Enterprises.

TREASURER'S STATEMENT

Financial results

ZSL recorded a group surplus on operations of £1.2 million and an overall surplus, after charging losses on valuation of investments, of £0.7 million. These compare with figures of £0.9 million operating surplus and overall surplus of £0.4 million in 2001, a year badly affected by the consequences of the Foot and Mouth Disease epidemic. 2002 can be seen as a satisfactory year in which ZSL exceeded its budgeted surplus but disappointing visitor numbers at London Zoo depressed the overall result.

ZSL remains dependent on the two zoos for the bulk of its income. In 2002 Whipsnade's visitor numbers reached 453,893, the highest for six years and over 100,000 more than the depressed numbers of 2001. Spend per head also increased considerably. By contrast the visitor numbers at London Zoo were 891,026, down marginally on the previous year. Income figures were, however, boosted by a major increase in Gift Aid recoveries and, in London, assisted by the money received from the GLA scheme for free school visits. ZSL is putting considerable efforts into generating additional income from Gift Aid which amounted to around £600,000 in 2002.

Both the Institute of Zoology and Conservation Programmes increased their revenues with new grants in 2002 but these are effectively ringfenced and in certain cases have been received and recorded in advance of the related expenditure in accordance with the requirements of charity accounting.

The increase in costs in the year compared to 2001 includes spending on maintenance deferred during the Foot and Mouth epidemic, costs incurred in collecting the increased gift aid recoveries, expenditure on staff and facilities for the GLA scheme and general wage and inflation rises.

No major capital projects were completed in 2002 and the total capital cash outflow of £2 million was largely spent on upgrading and refurbishment on both sites.

ZSL's balance sheet remains similar to last year. The carrying value of investments has fallen again due to the general fall in stock market value, resulting in a further loss of £536,000. ZSL has no borrowings apart from the interest-free deferred payment for the construction of the *Web of Life*, being paid off at £174,000 per year.

In common with other organisations ZSL's Pension Fund suffered severe losses on the valuation of investments in 2002, reducing its previously strong financial situation to one which is satisfactory only. In discussion with its Pension Fund trustees ZSL has agreed to increase its contributions to the Fund as a precautionary measure.

Trustees' statement accompanying the group summarised financial statements

The group summarised financial statements are not the statutory accounts but a summary of information relating to the Group Statement of Financial Activities, Group Statement of Cash Flows and the Group Balance Sheet. The full Trustees' report and financial statements, from which the summarised financial statements are derived, have been examined by Ernst & Young LLP and their audit report on them is unqualified. The full Trustees' report and financial statements and Ernst & Young LLP's audit report on them were approved on 8 April 2003 and will be submitted to the Charity Commission; copies can be obtained from the Finance Director at The Zoological Society of London, Regent's Park, London NW1 4RY.

Signed on behalf of the Trustees on 22 April 2003



Paul Rutteman, CBE, BSc (Econ), FCA
Treasurer

GROUP SUMMARISED FINANCIAL STATEMENTS FOR 2002

Summary Group Statement of Financial Activities for the year ended 31 December 2002

	Year to 31.12.02 £000	Year to 31.12.01 £000
Incoming resources		
Incoming resources from operating activities of the charity:		
Activities in furtherance of objects:		
Admission, membership and similar income	11,306	9,496
Publication sales and similar income	363	389
Contract and fee income	820	517
Grants	2,983	2,649
Activities for generating funds:		
Merchandising income and catering	4,433	4,000
Facility fee and rental income	199	225
Other sales and fees	478	542
Donations, legacies and other income	326	398
Interest and investment income	400	443
Total incoming resources	21,308	18,659
Resources expended		
Cost of generating funds:		
Fundraising costs	79	152
Merchandising and catering costs	2,988	2,581
Charitable expenditure:		
Cost of activities in furtherance of objects:		
Animal collection costs	12,375	10,512
Science and research	3,555	3,487
Conservation programmes	758	639
Management and administration	327	417
Total resources expended	20,082	17,788
Operating surplus for the year	1,226	871
Losses on investments	(536)	(432)
Surplus for the year	690	439
Total funds balance brought forward	23,107	22,668
Total funds balance carried forward	23,797	23,107

Summary Group Statement of Cash Flows for the year ended 31 December 2002

	Year to 31.12.02 £000	Year to 31.12.01 £000
Operating surplus for the year	1,226	871
Add: Depreciation	1,285	1,212
	2,511	2,083
Less: Purchase of tangible fixed assets (net of disposals)	(1,993)	(1,712)
Add: Sale of fixed asset investments (net of purchases)	62	(107)
	580	264
Changes in other assets and liabilities	(22)	(361)
Net cash inflow/(outflow)	558	(97)

Summary Group Balance Sheet at 31 December 2002

	31.12.02 £000	31.12.01 £000
Fixed assets		
Tangible assets	13,354	12,982
Investments	<u>2,634</u>	<u>3,232</u>
	15,988	16,214
Current assets		
Stocks	431	378
Debtors	2,099	1,574
Cash at bank and in hand	<u>8,035</u>	<u>7,477</u>
	10,565	9,429
Creditors: amounts falling due within one year	<u>(2,583)</u>	<u>(2,189)</u>
Net current assets	<u>7,982</u>	<u>7,240</u>
Total assets less current liabilities	<u>23,970</u>	<u>23,454</u>
Creditors: amounts falling due after more than one year	<u>(173)</u>	<u>(347)</u>
Net assets	<u>23,797</u>	<u>23,107</u>
Funds		
Unrestricted – General	17,803	17,017
– Designated	2,705	2,502
Restricted – Endowments	779	834
– Other	<u>2,510</u>	<u>2,754</u>
Total funds	<u>23,797</u>	<u>23,107</u>

Independent Auditors' Statement to the Trustees of the Zoological Society of London

We have examined the group's summarised financial statements for the year ended 31 December 2002 which comprise the Summary Group Statement of Financial Activities, Summary Group Statement of Cash Flows and the Summary Group Balance Sheet.

This report is made solely to the Trustees. To the fullest extent required by the law, we do not accept or assume responsibility to anyone other than the Trustees, for our work, for this report, or for the opinions we have formed.

Respective responsibilities of trustees and auditors

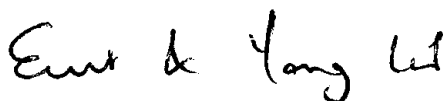
The trustees are responsible as trustees for the preparation of the summarised financial statements. We have agreed to report to you our opinion on the summarised statements' consistency with the full financial statements, on which we reported to the trustees on 8 April 2003.

Basis of opinion

We have carried out the procedures we consider necessary to ascertain whether the summarised financial statements are consistent with the full financial statements from which they have been prepared.

Opinion

In our opinion the summarised financial statements are consistent with the full financial statements for the year ended 31 December 2002.



Ernst & Young LLP
Registered Auditor
London

22 April 2003