

ZSL 98



The Zoological Society of London
Registered Charity 208728

Annual Report 1998 Part 2

Contents

Information about the Charity	2
Honorary Fellows	3
Council	3
Committees and Boards	4
Staff	6
Volunteers	9
Obituaries	9
Collaboration with zoological, conservation and research organizations	10
Representation	12
Publications by ZSL staff and research workers	13
Donations and legacies	16
Animal collection report	17
Animals in the collections	19

The Zoological Society of London

(Registered charity no. 208728)

Patron: Her Majesty The Queen

Principal address Regent's Park, London NW1 4RY
Also at: Whipsnade Wild Animal Park,
Dunstable, Bedfordshire LU6 2LF

ZSL is established by Royal Charter, and governed by By-laws and Regulations. The ruling body is Council. Members of Council, who include the Officers of the Society (the President, the Treasurer and the Secretary), are listed opposite. Council Members (the Trustees) are elected by the membership by postal ballot. Council has the power to co-opt.

Associated Charity:

The Zoological Society of London Development Trust (reg. no. 293255)

Non-trading holding company:

Zoo Operations Ltd (reg. no. 2226414)

Wholly-owned subsidiary trading companies:

Zoo Enterprises Ltd (reg. no. 1178687)

Zoo Restaurants Ltd (reg. no. 570005)

Whipsnade Wild Animal Park Ltd

(reg. no. 990860)

Bankers: Royal Bank of Scotland, Drummonds

Auditors: Ernst & Young

Investment Advisers: Henderson Investors

The objectives of the Society under the Charter are: 'the advancement of zoology by, amongst other things, the conducting of scientific research, the promoting of conservation of biological diversity and the welfare of animals, the care for and breeding of endangered and other species, the fostering of public interest, the improvement and dissemination of zoological knowledge and participation in conservation worldwide.'

Details of the policies and activities of ZSL in furtherance of these objectives are detailed in Part 1 of this Report. There was no change in the objectives or policies during 1998.

The Annual Report was approved by Council on 13 April 1999.

Honorary Fellows

Date of election

- 1977 HRH The Prince Philip, Duke of Edinburgh,
KG, KT
- 1991 HM The Emperor Akihito of Japan
- 1975 Professor Jean Anthony
*Museum National d'Histoire Naturelle,
55 rue de Buffon, Paris 53, France*
- 1975 Professor Jean Dorst
*Museum National d'Histoire Naturelle
(Mammifères et Oiseaux), 55 rue de
Buffon, Paris 53, France*
- 1984 Professor Ernst Mayr
*Museum of Comparative Zoology, Harvard
University, Cambridge, MA 02138-2902,
USA*
- 1988 Professor Dr Milton Thaigo de Mello
*Instituto de Ciencias Biologicas,
Universidade de Brasilia, Brasilia, Brazil
DF70 910*
- 1990 Professor Knut Schmidt-Nielsen
*Department of Zoology, Duke University,
Durham, North Carolina 27708-0325, USA*
- 1992 Professor Edward O. Wilson
*Museum of Comparative Zoology, Harvard
University, Cambridge, Massachusetts
02138-2902, USA*
- 1996 Professor John Maynard Smith
*School of Biological Sciences, University
of Sussex, Falmer, Brighton BN1 9QG*
- 1997 The Hon. Miriam Rothschild
Ashton Wold, Peterborough PE8 5LZ

Council

- 6/7 *President:* Sir Martin Holdgate, CB, MA, PhD,
DSc(h.c.), CBIol, FIBiol
- 6/7 *Treasurer:* Harry Wilkinson, OBE, MA, FCA
- 6/7 *Secretary:* Professor R McNeill Alexander, PhD,
DSc, CBIol, FIBiol, FRS
- 7/7 Sheila Anderson, BSc
- 4/4 John Barrington-Johnson (co-opted from 1 April
1999)
- 3/3 Jonathan Boyce, DM, MA, MSc, MRCP, FFPHM†
- 7/7 Michael Brambell, MA, VetMB, PhD, DVSc,
MRCVS
- 7/7 Professor Bryan Clarke, DPhil, FRS, *Vice-
President*
- 7/7 John Edwards, MA, FLS
- 6/7 Roger Ewbank, OBE, MVSc, MRCVS, FIBiol
Zakaria Erzinçlioglu, PhD (resigned 24 January
1998)
- 0/3 Professor Tim Halliday, DPhil†
- 3/4 Professor Mike Hassell, DSc, FRS *
- 7/7 Councillor Martin Jiggins, FRICS, FSVA
Clinton Keeling (resigned 8 March 1998)
- 3/4 Nancy Lane, OBE, DPhil, ScD, CBIol, FIBiol *
- 3/3 Ken Livingstone MP†
- 6/7 Christopher Marler
- 3/4 Sophie McCormick, PhD *
- 1/4 Derrick Moore, FCA (co-opted 3 June 1998)
- 6/7 Martin Rowson, MA
- 4/4 Ken Sims *
- 5/7 Ted Smith, BSc, CBIol, FIBiol
- 3/3 Tony Stevens, MA, BVSc, MRCVS, DipBact†
- 3/3 Professor Ian Swingland, PhD, DSc, CBIol,
FIBiol†
- 6/7 Jane Thornback, BSc, MSc
- 4/7 Professor Roger Wheeler, OBE, CBIol, FIBiol,
FRSE
- 5/7 Robert Wingate *

* From 3 June 1998

† To 3 June 1998

Attendance: actual/potential

Committees & Boards 1998

Committees & Boards of Council

Finance & General Purposes Committee

Terms of Reference: To monitor the financial management of the Society and act as an audit committee; and to preview and prepare papers for Council requiring policy or capital investment decisions.

Sir Martin Holdgate, CB, MA, PhD, CBiol, FIBiol, FRSA, FRGS, *Chairman*
Professor R. McNeill Alexander, PhD, DSc, CBiol, FIBiol, FRS
Sheila Anderson, BSc
Michael Brambell, MA, VetMB, PhD, DVSc, MRCVS
Martin Rowson, MA
Harry Wilkinson, OBE, MA, FCA

Conservation & Science Advisory Committee

Terms of Reference: To provide strategic vision, objectives and advice to Council and ZSL staff on conservation and science issues and activities; to monitor all the conservation and science activities of the Society, ensuring that they are implemented to the highest professional standards.

Keith Elringham, PhD, *Chairman*
David Chivers, PhD
Professor Bryan Clarke, DPhil, FRS
Lee Durrell, PhD
Bryan Grenfell, PhD
Robin Pellew, PhD
Professor Paul Racey, MA, PhD, DSc, FRSE, CBiol, FIBiol
Professor Ian Swingland, PhD, DSc, CBiol, FIBiol, FRSA, FRGS

Education & Information Advisory Committee

Terms of Reference: To provide strategic vision, objectives and advice to Council and ZSL staff on education issues and projects; to monitor the education and information activities of the Society, ensuring that they are implemented to the highest professional standards.

Sir Peter Newsam, MA, DipEd, *Chairman*
Sheila Anderson, BSc
Geraldine Baker, BSc
Steve Flowerday, MSc
Kate Harris, BA
Roger James
Sophie McCormick, PhD
Martin Rowson, MA

Animal Welfare Committee

Terms of Reference: To advise Council on matters relating to animal welfare in the Collections, at both London Zoo and Whipsnade Wild Animal Park, at the Institute of Zoology and in the work of Field Conservation & Consultancy.

Professor Patrick Bateson, PhD, ScD, FRS, *Chairman*
Tony Sainsbury, BVetMed, CertLAS, MRCVS, *Secretary*
Roger Ewbank, OBE, MVSc, MRCVS, CBiol, FIBiol
Andrew Higgins, BVetMed, MSc, PhD, CBiol, FIBiol, MRCVS
Arthur Lindley, MA, DPhil
Georgia Mason, PhD
David Pritchard, BVetMed, BSc, MPH, MRCVS
Stuart Semple, PhD
Christopher Sherwin, BSc, PhD
Miranda Stevenson, MA, PhD
Robert Wingate

Ethics Committee

Terms of Reference: To advise the Director of Science on welfare and ethical aspects of all scientific studies involving interventions with animals carried out by ZSL staff, or by other workers on ZSL premises or on ZSL animals.

Edmund Flach, MA VetMB, *Chairman*
Carol Williams, BTEC, HNC, *Secretary*
Alison Moore, PhD, *Home Office Liaison*
Simon Tonge, BSc
Alexandra Dixon, BA, MSc
Andrew Higgins, BVetMed, MSc, PhD, CBiol, FIBiol, MRCVS
Roger Ewbank, MVSc, CBiol, FIBiol, MRCVS, OBE
Ex officio:
Professor Morris Gosling, PhD, CBiol, FIBiol
Juliet Clutton-Brock, PhD, DSc
Georgina Mace, OBE, DPhil

Awards Committee

Terms of Reference: Council presents awards for contributions to zoology: The Prince Philip Prize, Thomas Henry Huxley Award, Stamford Raffles Award, Silver Medal, Scientific Medal, ZSL Frink Medal for British Zoologists and ZSL Marsh Award for Conservation Biology. The Committee advises Council on all matters relating to these awards.

Professor Mike Hassell, DPhil, DSc, FRS, *Chairman*
Geraldine Baker, BSc
Professor Geoff Boxshall, PhD, FRS
Professor Pat Butler, PhD, CBiol, FIBiol
Professor Sir Brian Follett, PhD, ScD, FRS
Professor Paul Harvey, DPhil, DSc, FRS
Dame Anne McLaren, DPhil, FRS
Professor Ian Newton, DPhil, DSc, FRS, FRSE
Professor J. Shepherd, BA, PhD
Professor W. J. Sutherland, BSc, PhD

Institute of Zoology Committee

Terms of Reference: To advise the Society and the University of London under the terms of the Agreement between them; to consider and make recommendations on all matters relating to the Institute of Zoology.

Professor Lance Lanyon, BVSc, PhD, DSc, MRCVS,
Chairman

Professor Bryan Clarke, DPhil, FRS

John Goss-Custard, PhD

Professor Alan Hildrew, PhD

Professor Colin Howard, PhD, DSc, MRCPATH, CBIOL,
FIBIOL

Professor Linda Partridge, DPhil, FRSE

Robin Pellew, PhD

Ex officio:

University of London

Vice-chancellor

Principal

Chairman of Convocation

Zoological Society of London:

President

Secretary

Treasurer

Director of Science: Professor Morris Gosling, PhD,
CBIOL, FIBIOL

London Zoo Board

Terms of Reference: To provide specialist advice on the objectives of London Zoo and on specific aspects of its management; to approve the annual business and financial plan and recommend it to Council; to approve any in-year variances to the plan; to review and approve any capital developments.

Ken Sims, *Chairman*

Michael Daubney

Stephen Harrison

Ken Livingstone, MP

Jonathan Swire

Jane Thornback, MSc

Director General: Richard Burge, BSc

Director, London Zoo: Jo Gipps, PhD

Director of Personnel: Ian Meyrick, BA, FIPD

Director of Finance: Norman Reed, BSc, FCA

Whipsnade Wild Animal Park

Terms of Reference: To provide specialist advice on the objectives of Whipsnade Wild Animal Park and on specific aspects of its management; to approve the annual business and financial plan and recommend it to Council; to approve any proposed in-year variances to the plan; to review and approve any capital developments.

Christopher Marler, *Chairman*

Sir David Madel, MP

Derrick Moore

John Piggott

Roger Smith

Professor Roger Wheeler, OBE, CBIOL, FIBIOL, FRSGS,

FRSA, FRSE

Director General: Richard Burge, BSc

Director, Whipsnade Wild Animal Park: Stuart Earley,
MInstD, MInstM, FInstSMM

Director of Personnel: Ian Meyrick, BA, FIPD

Director of Finance: Norman Reed, BSc, FCA

Advisory/Editorial Boards for ZSL Publications

Animal Conservation Advisory Board

Professor Jared Diamond, PhD

Professor John Lawton, CBE, PhD, FRS

Professor Stephen Stearns, PhD

Editors: Michael Bruford, PhD

John Gittleman, DPhil

Georgina Mace, OBE, DPhil

Robert Wayne, PhD

International Zoo Yearbook Editorial Board

Jeremy Mallinson, OBE, CBIOL, FIBIOL, FRGS, *Chairman*

Marcia Edwards, PhD, FLS

Nick Jackson

Professor Janet Kear, OBE, PhD

John Knowles, OBE

Georgina Mace, OBE, DPhil

Professor Roger Wheeler, OBE, CBIOL, FIBIOL, FRSGS,
FRSA, FRSE

Editors: Peter Olney, BSc, DipEd, CBIOL, FIBIOL, FLS

Fiona Fiskén, BSc

Journal of Zoology Editorial Board

Professor Sam Berry, MA, PhD, DSc, FRSE, CBIOL,
FIBIOL, FLS

Clive Catchpole, PhD

Professor Robert Elwood, BSc, PhD

Professor Peter Evans, MA, PhD, DPhil

Tim Flannery, BA, MSc, PhD

Professor Paul Harvey, DPhil, DSc, FRS

Professor Reino Hofmann, TA, Dr med vet, Dr habil

Katharina Mangold, PhD

Professor Brian Morton, PhD

Tim Roper, PhD

Professor John Skinner, MSc, PhD, CBIOL, FIBIOL,
FRS(SA)

Professor Ian Swingland, PhD, DSc, CBIOL, FIBIOL,
FRSA, FRGS

Editor: Juliet Clutton-Brock, PhD, DSc

Library Advisory Group

Peter Olney, BSc, DipEd, CBIOL, FIBIOL, FLS, *Chairman*

Professor R. McNeill Alexander, PhD, DSc, CBIOL,
FIBIOL, FRS

Elizabeth Barratt, PhD

John Edwards, MA, FLS

Beryl Leigh, PhD

Joan Thorne

Staff

As at 31 December 1998

Directors

Director General: Richard Burge, BSc
Director of Science: Professor Morris Gosling, PhD, CBiol, FIBiol
Director, London Zoo: Jo Gipps, PhD
Director, Whipsnade Wild Animal Park: Stuart Earley, MInstD, MInstM, FInstSMM
Director, Field Conservation & Consultancy: Alexandra Dixon, BA, MSc
Director of Finance: Norman Reed, BSc, FCA
Director of Personnel: Ian Meyrick, BA, FIPD

Central Functions

Director General: Richard Burge, BSc
Secretary/PA to Director General: Karen Harding
Secretary to the Officers: Anne Chapman

Personnel

Director of Personnel: Ian Meyrick, BA, FIPD
Senior Personnel Officer: Marcia Latty, GradIPD
Personnel Administrator: Debbie Wade
Pensions Administrator: Peter Carey (p/t)

Health and Safety

Security & Safety Manager: Brian Nutkins
Secretary: Brenda Tonks
Consulting Medical Referee: Kenneth Lewis, MA, BM, BCh
First Aid Attendant: Grace Reay
Weekend First Aid Attendant: vacant

Switchboard/Reception

Receptionists: David Hitchcock; Joanne Kent; Jennifer Molineaux; Sarah O'Neill; Gwen Manning

Finance

Director of Finance: Norman Reed, BSc, FCA
Secretary: Susan Morgan
Financial Accountant: Joan Jupp
Management Accountants: Charles Biggie; Keith Hayward, FCCA
Cash Book Keeper: vacant
Chief Cashier: Dave Lack
Cashiers: Paul Gibbs; Les Oxley; Joe Piggott
Payments Supervisor: Lynette Archer-Morgan
Wages clerk: vacant

Fellowship

Fellowship Services Manager: Marion Hoyland

Fundraising

ZSL Fundraiser: Colette Dodge, BEd

Information Technology

IT Manager: Rob Jinman
IT Support Assistant: Sean McBirnie

Library

Librarian: Ann Sylph, BSc, MSc, MIInfSc
Assistant Librarian: Michael Palmer, BA, MA
Library Assistant: Karen Deakin, BSc, PGDipIM

Press & PR Office

Senior Public Relations Officer: Kirstie Macfarlane, BA
Assistant Public Relations Officers: Debbie Curtis, BSc; Helen Golesworthy, BA

Publications

ZSL Scientific Books, comprising International Zoo Yearbook, Conservation Biology and Symposia series, Science for Conservation
Editors: Peter Olney, BSc, DipEd, CBiol, FIBiol, FLS; Fiona Fiskin, BSc
Assistant Editor: Helen Stanley, PhD, BSc
Sales Administrator: Mychael Barratt (p/t)

Journal of Zoology, Symposia, Nomenclator Zoologicus, Zoological Record

Editor, Journal of Zoology: Juliet Clutton-Brock, PhD, DSc
Honorary Editor, Zoological Record & Nomenclator Zoologicus: Marcia Edwards, PhD, FLS
Assistant Editor: Linda DaVolls, BA
Editorial Assistant: Patricia Manly

Animal Conservation

Editors: Michael Bruford, PhD; John Gittleman, DPhil; Georgina Mace, OBE, DPhil; Robert Wayne, PhD
Assistant Editor: Linda DaVolls, BA

Institute of Zoology

Director: Professor L. Morris Gosling, PhD, CBiol, FIBiol
Institute Administrator: Christina Herterich, ACIS
Conservation Genetics: Michael W. Bruford, PhD
Ecology: Richard Pettifor, PhD
Reproductive Biology: William V. Holt, PhD
Veterinary Science: Anthony W. Sainsbury, BVetMed, CertLAS, MRCVS

Administrative and Support Staff

Assistant Institute Administrator: Phillip G. Cottingham, BTec (CED), MIScT
PA to Director of Science: Joanne Keogh
Administrative Assistant: Karen Nicholas
Secretaries: Anna-Marie Cummins; Catherine Kerr
Chief Technician (Animals): Carol Williams, BTEC, HNC
Senior Technician (Animals): Andrew G. Hartley, BAgricSc
Animal Technicians: Mandy Gordon, IIAT; Jake Rozowski
Senior Workshop Technician: Selwyn Mundy
Senior Photographic Technician: Terry R. Dennett, MinstPI
General Laboratory Assistant: Breda Farrell

Honorary Research Fellows

Sarah Cleaveland, VetMB, PhD; George H. DuBoulay, CBE, MB, BSM, FRCP, DMRD; Stephan Funk, PhD; Julie Garnier, DVM; Heather Hall, PhD; Rob Hammond, PhD; Peter Kertesz, BDS, LDS; Professor James K. Kirkwood, BVSc, PhD, MRCVS; Nick Oguge, PhD; Helen J. Shaw, PhD; Amanda Vincent, PhD; Professor Paul F. Watson, BSc, PhD, BVetMed, DSc, MRCVS

Postdoctoral Staff and Veterinary Officers

Peter Armbruster, PhD; Elizabeth M. Barratt, PhD; Michelle Bayes, PhD; Mark A. Beaumont, PhD; Peter M. Bennett, PhD; Andrew F. Bourke, PhD; Kate Byrne, PhD; Christopher Carbone, BSc, DPhil; Lounes Chikhi, PhD; Peter Cotgreave, DPhil; Timothy Coulson, PhD; Guy Cowlshaw, PhD; Andrew A. Cunningham, BVMS, MRCVS; Sarah M. Durant, PhD; Alireza Fazeli, PhD; Edmund Flach, MA, VetMB, MSc, MRCVS; Benoit Goossens, PhD; Louisa Jenkin, PhD; Paul Jepson, BVMS, MRCVS; William Jordan, PhD; Javier Lopez, MSc, MRCVS; Georgina M. Macem, DPhil; Alison Moore, PhD; Amanda Pickard, PhD; S. Craig Roberts, PhD; Marcus Rowcliffe, PhD; Stuart Semple, PhD; Susan M. Thornton, BSc, BVetMed, MRCVS; James N. Webb, PhD

Technicians

Chief Technician: David Cheesman, BTec, HNC
Senior Technicians: Dada Gotelli, BSc; Daphne I. Green, HNC, AIScT
Technicians: Michelle Andrew, MSc; Matilde R. Fernandez Ojeda, MV; Louise Gosney, BSc; Miranda Kadwell, BSc; Chrysoula Karakosta, MSc; Sarah Lourie, BA; Shaheed Macgregor, HTec, MSc; Elisabeth Thornton, BSc

Research Assistants: Rob Deaville, BSc; Nicholas J. B. Isaac, BSc

Senior Veterinary Nurse: Anthony K. Fitzgerald, RANA
Veterinary Nurses: Gillian Ahearne, VN; Christine Dean, VN; Joanne Knibb, VN

Postgraduate Research Students

Samuel A. Andanje, MSc; Johnathan Baillie, MES; Michelle Bayes, BSc; Jacob Bro-Jorgensen, MSc; Tamsin Burland, BSc; Stephen P. Casey, BSc; Claudio Ciofi, BSc; Frank M. Clarke, BSc; Trevor Coote, BSc; Daniella de Luca, BSc; Juliet Dukes, MSc; Manuela Fonseca, MSc; Angela Formia; Jim Groombridge, BSc; Katherine Little, MRes, BA; Alfredo Medrano, BSc; Jocelyn Milner, BSc; Octavio Paulo, BSc; Piumi Pelendagama, BSc; Russell Seymour, MSc; Cristiane Silveira, MSc; Lisa Thurston, BSc; Saffron Townsend BSc; Stephanie Wehnelt, MSc

Field Conservation & Consultancy

Director: Alexandra Dixon, BA, MSc
Secretary/PA to Director: Jane Loveless
Project Manager: Claire Belsham, BSc

Overseas Staff

Adam Britt, PhD; Kevin Dunham, BSc, MPhil; Jacques Flamand, BSc, BA, VetMB, MRCVS; John Grainger, PhD; Rob Hammond, PhD; Richard Kock, BA, VetMB, MRCVS; Kathryn Monk, PhD; Saeed Mubarak, VetMB; Iyad Nader, PhD; Zelealem Ashenafi Tefera, MSc; Tim Wachter, PhD; Stuart Williams, PhD; Bruce Winney, PhD

London Zoo

Director: Jo Gipps, PhD

Secretary/PA to Director: Barbara Salmon, BA

Animal Management

Senior Curator: Simon Tonge, BSc

Secretary: Catherine Hallsworth, BA

Conservation Programmes Co-ordinator: Sarah Christie, BSc

Registrar: Elspeth Chaplin

Zoo Manager: Bill James

Curator of Mammals: Doug Richardson

Curator of Invertebrates: Paul Pearce-Kelly

Curator of Lower Vertebrates: Heather Hall, PhD

Head Keepers: Gerald Asher; Mick Carman; Ray Charter; Dave Clarke; Brian Harman; Paul Harrington; Brian Harris; Fred Smith; Linda Walker; Esther Wenman, BA; Frank Wheeler

Senior Keepers: Alan Alder; Nichola Burnett; Mike Clark; Caroline Connor; Matthew Fagg; Amanda Ferguson, BSc; Malcolm Fitzpatrick; Matthew Hennessy; Andy James; Patsy Joseph; Paul Kybett; Margaret Lamb; Tracey Lee; Keith Lloyd; Andrea McKenna; Simon Mannall; Terry March; Duncan McGinnie; Jeff Nicklin; Jacqueline Ossowski, BSc; John Pullen; Dave Robinson; Jim Robson; Mike Tiley; Mary Welsh; Chris Wickenden; Sarah Young; Steve Young

Qualified Keepers: Paul Atkin; Vanessa Long; Karen Nolan, BSc; Lawrence Raybone; Una Richardson; Duncan Rowlatt, BSc; Scott Sturgeon; Luciana Wagner; Craig Walker; Steve Whitelock

Trainee Keepers: Margaret Baukham; Tony Cholerton; Mark Habben, Rachel Jones, MSc; Oscar Long; Lyndsey Marsh; Newton Pellatt; Teague Stubbington, BSc; Olivia Walter, BSc

Marketing & Public Relations

Head of Marketing & Public Relations: Sharon Ament, MA, DipCIM

Secretary: Anna Summers, BA

Group & Conference Sales Executive: Terry Lester

Promotions Executive: Jill Ratcliffe, BSc

Lifewatch & Adoptions Manager: vacant

Lifewatch & Adoptions Administrator: Sarah Leggett

Marketing Administrator: Claire Bavington

Visitor Information & Education

Head of Visitor Information & Education: Claire Robinson, BEd

Secretary: Joanne Cooper
Education Officers: Sandi Bain, BSc; Anna Keen, BSc, MSc
Volunteer Co-ordinator: Natalie Pain, BA, PGDip
Bookings Co-ordinator: Tasja Gardner, BA
Interpretation Officer: Clare Kelly, BSc
Graphics Co-ordinator/Print & Stationery Buyer: Adrian Taylor

Site & Services

Site & Services Manager: Graham Roden
Secretary: Dot Price
Maintenance Supervisor: Colin Rolfe
Contracts Supervisor: Mike Swallow
Craftsmen: Tony Connolly; Martin Foster; John Froud; Bill Manly; Steve Roberts; Terry Sheehan
Carpenter: Lee Risdale; Stan Bonsey
Semi-skilled Craftsmen: Jim Baker; Dave Field; John Pearce; Gary West
Electrical Foreman: Robin Fitzgerald
Electrician: Peter Smith
Head Gardener: Martin Pett
Gardeners: Ian Ament; Noel Heaphy; Rodney Lynch; George Manly; Jacqueline Smith; Graham Southard
Supplies Buyer: Chris Major
Animal Food Stores Chargehand: Bob Ashmore
Butcher/Driver: Ron Harrison
Grounds Supervisor: Peter Walker-Croft
Grounds Foreman: Jamie Turner
Groundstaff: Beatrice Ampong; Graham Bukovics; Terry Flannery (p/t); Colin George; Gerry Houlder; Colin Jeans; Renuka Lutchman; Alice Sarpong; Anna Thornburrow; Odit Tiwari
Security Gatekeepers: Melvin Brockwell; Paul Brown; George Scofield
Stores Assistant: Alex James

Visitor Services

Head of Visitor Services: Yvonne Ubels
Assistant Retail Manager: Jayne Powell
Office Administrator: Elizabeth Allard
Supervisors: Gary Constantine; Evon Nicholas
Warehouse Supervisor: Neil Foot
Visitor Services Assistants: Margaret Brown; Alison Coutts; Patricia Delius
Admissions Officer: Bob McLaughlin
Assistant Admissions Officer: Suzanne Cole
Senior Gatekeeper: Sharm Ramdass
Visitor Services Assistants: Golam Chowdhury (p/t); Patience Djima; Mandy Jones (p/t); Bala Patel (p/t); Anne Powell; Christopher Powell
Ticket Collector (p/t): Jack Richards

Events Manager

Events Manager: Roger Tomlinson
Senior Presenter: Andy Hallsworth
Presenters: Mandy Currie; Rob Goodchild; Michelle Povada, BSc

Whipsnade Wild Animal Park

Director: Stuart Earley, FInstD, MInstM, FInstSMM
Assistant to Director: Gill Farrell

Finance and Information Technology

Financial Controller: Roman Bodnarec, MIDM
Senior Accounts Clerk: Carol Davies
Assistant Accounts Clerk: Faye Kirby
Senior Cashier: Joan Lee
Accounts/Cashier's Assistant: Janet Hughes
Cashier's Assitant: Sylvia Black
Stores: Tony Latham

Operations

Operations Manager: Linda Hughes, GradIPD
Operations Assistant: Jo Woodhead
Volunteer Co-ordinator: Graham Lucas
Railway Manager: Ian Gordon
Supervisor, Railway: Tony Button
Railwayman: Mick Dickens
Park Services Co-ordinator: Mick Shillingford
Supervisors, Park Services: Ted Baisbrown; John Bradley
Groundsmen: Ron Beeton; Bernard Hawkins
Gardens Chargehand: Rob Scanlan
Gardener: Steve Rutter
Works Chargehand: Grant Guild
Craftsmen: Malcom Guild; Jim Harrold; Dave Law; Jim Whinnett
Trainee: Rob Harris

Retail and Main Gate

Retail & Gate Manager: Maureen White
Assistant Retail/Gate Supervisors: Yasmin Bates; Tessa Roch
Gatekeeper: Tony Newman

Catering

Banqueting Manager: David Barker
Deputy Managers: Zoe Fitzpatrick; Simon Kemp
Assistant Managers: Amanda Feenan; Jackie Horswell
General Catering Assistant (p/t): Marjorie Grizzell

Marketing & Development

Marketing & Development Manager: Miranda Kennett-Scott, BA, MSc, MDip, MCIM
Senior Customer Services Assistant: Margaret Hull
Graphics Executive: Simon Hodge, BSc
PR Executive: Jane Reeve, BSc
Membership Executive: Natalie Kelly

Education

Education Officer: Claire Bidder, BSc

Animal Management

Curator: Nick Lindsay, BSc, CBiol, MIBiol
Assistant to Curator: Dena Richards
Regional Co-ordinators: Rob Hutton; Andy White
Animal Activities Co-ordinator: Les Radford
Deputy Co-ordinators: Clive Bates; Cliff Tack
Bird Show Organiser/Demonstrator: Andy Reeve

Senior Keeper in charge of Elephants: Lee Sambrook
Senior Keepers: John Baines; Mark Best; Mark Brett;
Roger Catchpole; Carole Day; Joy Lear; Melvin Lear;
Alan Morris; Trevor Moxey; Frank Smith; Marilyn
Spittel; Ken Taylor; Pete Williams

Qualified Keepers: Rebecca Cooper; Phil Curzon; Sarah
Gollop; Jim Gregory, BSc; Mark Holden, BSc; Luke
Warren; Veronica Watkins; Craig White; Donovan
Glynn

Trainee Keepers: Sian Lamb; Rebecca Raymond; Cheryl
Seymour; Sarah Taylor, BSc; Corina Thorne

Volunteers

As at 31 December 1998

Administration

Jill Beck; Dorothy Gingell; Maureen Hart

Animal Management

Amanda Brown; Jo Castle; Charlotte Coals; Phil Cottons;
Nigel Court; Ailsa Farqhar; David Gibson; Jane Harvey;
Isobel Hood; Anna Humberstone; Kerry Lyon; Susan
Miller; Jacky Newman; Sarah Norris; Katie Rooke; Jee
Young Shin; Andrew Sidders; Roger Stanley; Nicola
Strazzulo; George Suntar

Education

Laurie Allen; Raj Amin; Hazel Amor; Peter Arnold; John
Ayrey; Arfan Aziz; Pam Beanlands; Jill Beck;
Dominique Beerli; Ian Bishop; Denise Blackwell;
Michael Bond; Sheena Bose; Dave Brick; Sally Brough;
Joan Browett; Simon Brown; Lilah Cameron; Debbie
Catt; Lai Chung Choy; Karen Cilvert; Steph Claxton;
John Clifford; Sid Cocks; Andrew Colman; Mary
Colwill; Dorothy Copeland; Mary Creedon; Daphne
Cross; Tracey Cullen; Ann Curtis; Geoff Cutting;
Gladys Davies; Leonard Davies; Phil Davies; Rachel
Derrick; Mary De Zouche; Cathy Ellis; Felix Fifer;
George Fitt; Sheila Fitt; Janet Gates; Celia Gaya

Trish Gibson; Angela Gilham; Gillian Golding; Valery
Golding; Nevil Gorthy; Elizabeth Grabow; Dot Gyngell;
Daphne Hamilton; Maureen Hart; Ron Hart; Katherine
Hartmann; Margaret Hinkley; James Holden; John
Hopkins; Joyce Hunter Lieberman; Susan Hyde; Gina
James; Janice James; Jennifer Jennings; Iris Johnson;
Edward Jones; Beverley Jordan; Christy Koleszar;
Robert Langstone; Sarah Lenton; Belinda Line; Joyce
Lockyear; Neale Lunn; Rhonda Maclean; Veronica
McDougal; Gary McGuire; Mary Macpherson; David
Marlborough; Hilary Marsh; Marina Marshall

Beryl May; Tim May; Carol Mintey; H. A. Moore; Jackie
Mutton; Mark Navin; Smain Nedjari; Jo Norcup; Anne
O'Brien; Stephen Otter; Prafulla Patel; Rosalind Pike;
Jonathan Pollard; Pamela Portefield; Jane Powers;
Nargiz Price; Vincent Price; Jean Reich; Hilda Reiley;
Renato Ruocco; Jackie Russell; Jo Smith; Julie Smith;
Maurice Sobell; Ruth Sober; Debbie Spellman; Jo

Stafferton; Margaret Stafford; Caron Somerset; Susan
Street; Abigail Tarr; John Thompson; M. Tracy; Ann
Turner; Amelia Walker; Antony Walker; Delene Welch;
Jane Wheeler; Christine White; Sarah Winfield;
Georgina Wong; David Wooderson; Jonathan Wright

Library

Peter Arnold; Ailsa Edwards; Valery Golding; Royce
Harris; Bryan Johnson; Hilary Marsh; Joan Salamon;
Maurice Sobell; Andre Verstraete

Whipsnade Wild Animal Park

Jean Anderson; Michael Atkins; Heather Bardner; Jill
Bilcock; Jill Broad; John Brooker; Allison Brookes;
Leile Brown; Ron Brown; Carol Butler; Sidney Cocks;
Maureen Cook; Lee Crossman; Kathleen Eames;
Kenneth Eames; Arthur Ellis; Pamela Erwood; Elaine
Fairey; Nicola Field; Wendy Fitzgerald; Amanda
Fraser; Denis Garner; Maggie Garrett; Jean Gercken

Judy Gill; Erica Godman; Evelyn Goodman; Nevil
Gorthy; Emma Gray; Jim Griffin; Norman Hancock;
Maureen Hardy; Pam Harry; Peter Hawkins; Karen
Herbert; Pauline Hodgson; Dorothy Isaacs; Dennis
Jones; Miriam Martin; Pat McBride; Betty McHugh;
James Marson; Barbara Maryan; Stuart Minall; Patricia
Mitchell; Lyn Paynter; Audrey Perrott; Gilly Pugsley;
Ilid Putnam; Elizabeth Richmond; Sharon Roberts

Rebecca Sandifer; Raye Sawyer; Peter Scrivener;
Christine Sharpe; Kenneth Sharpe; Walter Smith; Mary
Snoxall; Helen Speed; Mac Speed; Paul Susman;
Sandra Swan; Lorna Taylor; Samantha Taylor; Gillian
Tomkins; Hans van der Grinten; Arthur Waring;
Elizabeth Webb; Ronnie Westcott; Naomi White;
Patricia Wickens; Jennifer Wynn; Jean Young; Jo
Young

*The Society warmly thanks all the volunteers who
have done so much to help its work in 1998.*

*If you are interested in becoming a volunteer, please
ask the Volunteer Co-ordinators at London Zoo or
Whipsnade Wild Animal Park for further details.*

Obituaries

We record with regret the deaths in 1998 of the
following pensioners:

Mr M. Carding; Mrs C. M. T. Hawkins;
Mr C. W. J. Henderson; Mrs L. McGuinness;
Mr A. W. Ransome; Mr R. E. Willis

Collaboration with Zoological, Conservation and Research Organizations

Collaborative projects

- African Wildlife Foundation*: Ecology of Ankole Cattle, Lake Mburo National Park, Uganda.
- BirdLife International*: Conservation of endangered invertebrate species from Fregate Island, Seychelles; The health of the Seychelles magpie robin and the implications of disease as a cause of decline.
- British Airways Environment*: Joint training programme between Whipsnade and Wildlife Department in Ghana.
- Central Veterinary Laboratory*: Transmissible spongiform encephalopathies of captive wild animals.
- Centre de Coopération Internationale en Recherche Agronomique pour le Développement (CIRAD) France*: Investigation of the role of wildlife in rinderpest epidemiology in Africa.
- Centre Internationale des Recherches Médicales de Franceville (CIRMF), Gabon*: Genetics of bushbabies and gorillas.
- Department of the Environment, Darwin Initiative*: Integrating traditional resource management with conservation of biodiversity and of the Ethiopian wolf; Survey of biodiversity in Akagera National Park, Rwanda; Peruvian camelid genetic resources.
- Department For International Development*: Chitwan Wildlife and Domestic Veterinary Project, Nepal; Cows, Culture and Conservation, Uganda.
- Department of National Parks and Wildlife Conservation, Nepal*: Chitwan Wildlife and Domestic Veterinary Project.
- Department of Wildlife, Ghana*: Management of wildlife in Accra and Kumasi Zoos.
- Desert Research Foundation of Namibia*: Behavioural ecology of Nama pastoralists, Namibia.
- Design SA Greece*: St Katherine's Protectorate Management Plan, Sinai.
- Duke University Primate Centre, USA*: Reintroduction of black and white ruffed lemur, Madagascar.
- Durrell Institute for Conservation Ecology, University of Kent*: Conservation in Ethiopia; Thesis advisor.
- Earthwatch*: Conservation biology of the Komodo dragon.
- Egyptian Environmental Affairs Agency*: Management plan for St Katherine's Protectorate, Sinai; Reintroduction of Egyptian tortoise
- Emory University, USA*: Phylogeny of human cultural evolution; Cross-cultural analysis of the evolution of human kinship systems.
- English Nature*: Genetics of keynote species including red squirrels, wartbiter and field crickets and greater horseshoe bats; Species recovery plans for above species and mole cricket; Management of SSSI at Whipsnade; Dormouse and smooth snake captive-breeding projects; Breeding and reintroduction of Barberry carpet moth; Field cricket breeding and release programme.
- Environmental Know-How Fund*: Feasibility study for the reintroduction of European bison in Romania.
- Estación Experimental de Zonas Áridas, Spain*: Reproduction in dama gazelle.
- Ethiopian Wildlife Conservation Organization, and Regional Council of Amhara State*: Integrating traditional resource management with the conservation of biodiversity and of the Ethiopian wolf.
- Great Bustard Trust*: Collaborative work on management and conservation of great bustards.
- HM Customs*: Housing and advice on identification of reptiles, birds and mammals.
- Hornocker Wildlife Institute, Idaho*: Hunting lease management in the Russian Far East.
- Humboldt State University, California*: Population dynamics of geese
- Huszar Brammah*: Leuser Development Programme, Sumatra.
- Institute of Terrestrial Ecology, Banchory*: Population dynamics of sheep and deer.
- Institute of Oceanography, Nna Trang, Vietnam*: Seahorse project.
- Jersey Wildlife Preservation Trust*: Reintroduction of black and white ruffed lemur, Madagascar
- Joint Nature Conservation Committee*: Analysis of wetland bird survey (weBS) data.
- Kadoorie Farm and Botanic Garden Fauna Conservation Dept., Hong Kong*: Mammal husbandry advice.
- Kenyatta University, Kenya*: Mole-rat genetics.
- King Khalid Wildlife Research Centre, Saudi Arabia*: Gazelle genetics; reintroduction, protected area management.
- King Mahendra Trust for Nature Conservation, Nepal*: Central staff training; Zoo mammal husbandry advice; Chitwan Veterinary Project.
- King Mahendra (UK) Trust*: Support for Chitwan Veterinary Project.
- Macaulay Land Use Research Institute*: Plant-herbivore interactions and the population demography of Soay sheep.
- Madagascar Fauna Group*: Reintroduction of black and white ruffed lemur, Madagascar.
- Manchester Metropolitan University*: ARKS and SPARKS training course.
- McGill University, Canada*: Taxonomy, field conservation and breeding of sea horses and sea moths.
- Michigan State University, USA*: Hyaena genetics.
- Moredun Research Institute*: Epidemiology of parapoxvirus infection in squirrels.
- Namibian Evolutionary Ecology Group, Namibia*: Behavioural ecology of Nama pastoralists, Namibia.
- Natural History Museum*: Conservation area selection research; Taxonomy and conservation of Lake Tana barbs; Threats to cetaceans around England and Wales; Specimens for research and display; Parasitic infections of captive and free-living wild animals.
- Nature Protection Trust for Seychelles*: Conservation of endangered invertebrate species in Fregate Island, Seychelles.
- Nature Conservation Bureau*: Phylogenetics of bustards.
- Norwegian Polar Institute, Norway*: Population dynamics of geese.
- Oxford Brookes University, Oxford*: Bushbaby genetics.
- Rare Breeds Survival Trust*: Genetics of rare breeds of

- cattle and sheep.
- Royal Society for the Prevention of Cruelty to Animals:* Consultant veterinary advice; Advice on management and identification of reptiles and invertebrates.
- Royal Society for the Protection of Birds:* Consultant veterinary advice; Analysis of weBS data.
- Royal Veterinary College:* Parasitology research and clinical cases; Parasites and host behaviour.
- St Mary's Hospital:* Retroviral infections in wild animals.
- San Francisco State University, USA:* Genetics of birds in Cameroon.
- School of Oriental and African Studies, London:* Comparative analysis of Nama and Damara survival strategies, Namibia.
- Scottish National Heritage:* Phylogenetics of Scottish wildcat; Population viability analyses of geese.
- Silvi Nova, Sweden:* Leuser Development Programme, Sumatra.
- Sumatran Tiger Project:* Tiger survey.
- Tebodin, Belgium:* St Katherine's Protectorate Management Plan, Sinai.
- The Wildfowl and Wetlands Trust:* Individual-based models, population dynamics of geese; Analysis of weBS data.
- Trinity College, Dublin:* Genetics of rare breeds of domestic livestock.
- Uganda Wildlife Authority:* Ankole Cow, Lake Mburo Project.
- University of Aberdeen:* Phylogenetics of pipistrelle bats.
- University of Bristol:* Social structure of greater horseshoe bat; Individual-based behavioural models.
- University of British Columbia, Canada:* Reproductive strategies and differences in individual behaviour.
- University of California at Davis, USA:* Research on Serengeti cheetahs.
- University of California at Los Angeles, USA:* Genetics research.
- University of Cambridge:* Behavioural study on Patagonian cavy at Whipsnade; Behavioural ecology study of Chinese water deer at Whipsnade; Host-parasite interactions in Soay sheep; Population dynamics of deer and sheep; Extinction risk dynamics in birds and mammals.
- University of Cambridge, Sea Mammal research Unit:* Gene flow in populations of seals.
- University of Cape Town, South Africa:* Buffalo genetics.
- University of Chicago, USA:* Baboon genetics.
- University of Copenhagen, Denmark:* Genetics of birds in Cameroon and African bovids.
- University of East Anglia:* Genetics of rare breeds of cattle and sheep.
- University of Edinburgh:* Genotype by environment interactions in red deer and Soay sheep.
- University of Grenoble, France:* Genetics of rare breeds of domestic livestock.
- University of Groningen, The Netherlands:* Individual-based behavioural models of geese, Population dynamics in geese.
- University of Kent:* Capture-mark-recapture estimates of the survival of Soay sheep.
- University of Leeds:* Mechanical properties of wallaby tendons.
- University of Lisbon, Portugal:* Conservation genetics and captive breeding of endangered lizard (*Lacerta lepida*) from Berlenga Island, Portugal.
- University of Liverpool:* Primate conservation biology.
- University of London, Imperial College:* Plant-herbivore interactions and population demography of Soay sheep; Transmissible spongiform encephalopathies of captive wild animals; Extinction risk analysis of mammals; Determinants of primate population persistence in disturbed habitats.
- University of London, King's College:* Starfish genetics.
- University of London, Queen Mary & Westfield College:* Health, welfare and population genetics of red squirrels in the UK reintroduction programme; Epidemiology of parapoxvirus infections in squirrels.
- University of London, University College:* Genetic variation in the horse; Control of gene expression during spermatogenesis; Evolutionary biology of alanine glyoxylate aminotransferase; Individual-based behavioural models; Distribution, abundance and rarity in African primates.
- University of Madison, USA:* Song sparrow genetics.
- University of Montpellier II, France:* Genetics of rare breeds of domestic livestock.
- University of Namibia, Namibia:* Behavioural ecology of Nama pastoralists, Namibia.
- University of Natal, South Africa:* Ecological aspects of vigilance in wild samango monkeys.
- University of Nottingham:* *Partula* snail programme.
- University of Oregon, Oregon:* Viability analysis to assess extinction risks in managed populations.
- University of Oslo, Norway:* Population dynamics of geese.
- University of Oxford:* Mate choice and male reproductive success in wild brown rats; Development of microsatellite library for study of population genetics of range expansion by cynipid gall wasps; Analysis of reproductive strategies and population dynamics in Wytham tits.
- University of Oxford, Wildlife Conservation Research Unit:* Conservation of the Ethiopian wolf.
- University of Reading:* Depletion and individual-based models.
- University of San Marcos, Peru:* Genetic variation in South American camelids.
- University of Sheffield:* Conflicts in social Hymenoptera (AFBG).
- University of Stirling:* Population dynamics in sheep.
- University of Surrey:* Fungal infections of amphibians and invertebrates.
- University of Sussex:* Communication in African elephants.
- University of Trondheim, Norway:* Population dynamics of geese.
- University of Vienna, Austria:* Genetics of rare breeds of domestic livestock.
- University of Virginia, USA:* Extinction degrees in mammals.

University of Washington, Seattle, USA: Mark-recapturing and prey choice analysis on Serengeti cheetahs.

Wildlife Conservation Society, New York: Cheetah conservation (funding only); Conservation biology of the Komodo dragon; Hunting lease management in the Russian Far East.

World Wide Fund for Nature East African Regional Office: Assessment of black rhino management in Zimbabwe.

Representation

Animal Health Information Specialists (UK & Ireland): Ann Sylph (Member).

Animal Reproduction Science: William Holt (Member, Editorial Board).

ASLIB Biosciences Group: Ann Sylph (Membership Secretary).

Association of Leading Visitor Attractions: Jo Gipps (Hon. Treasurer)

British Andrology Society: William Holt (Committee Member); Alison Moore (Committee Member).

British Veterinary Zoological Society: Andrew Cunningham (Hon. Treasurer); Sue Thornton (Council Member).

British Wildlife Rehabilitation Council: Tony Sainsbury (Member, Steering Committee).

Cambridge College of Agriculture and Horticulture: Whipsnade Industrial Link.

Centre for Ecology & Evolution, University of London: Morris Gosling (Member, Steering Committee).

Coral Cay Conservation: Martin Cooke (Patron).

Department of the Environment: Peter Bennett (Member, Cetaceans Strandings Steering Group).

Durrell Institute of Conservation & Ecology: Michael Bruford (Visiting Lecturer).

European Association of Zoological Parks & Aquaria: London Zoo (Institutional Member); Sarah Christie (Co-ordinator, Tiger EEP and Amur leopard EEP; Member EEP Felid TAG); Andrew Cunningham (Veterinary Adviser, EEP Penguin TAG); Sarah Durant (Member, Cat Specialist Group); Nick Lindsay (Member EEP Cheetah, Gruiformes, Deer, Przewalski's Horse, Scimitar-horned oryx, Greater one-horned rhino, White rhino TAGs; Co-Chair, Rhino TAG; Chairman, Nile Lechwe EEP); Paul Pearce-Kelly (Co-Chairman, Terrestrial Invertebrate TAG; Co-ordinator, Partula snail EEP); John Pullen (Member, EEP Primate TAG); Andy Reeve (Member, Falconiformes TAG); Doug Richardson (Co-ordinator, Asiatic lion EEP; Member, EEP Felid, Antelope, Monotreme and Marsupial TAGs; Simon Tonge (Chairman, EEP Toucan & Turaco TAG); Member, EEP Pigeon, Hornbill, Passerine, Parrot and Ciconiiform TAGs; Adviser to EEP Reptile TAG); Frank Wheeler (Corresponding Member, EEP Marsupial TAG).

Fauna and Flora International, Conservation Committee: Paul Pearce-Kelly (Member).

Federation of Zoological Gardens of Great Britain and

Ireland: London Zoo (Member); Whipsnade Wild Animal Park (Member); Jo Gipps (Hon. Treasurer) Council: Jo Gipps

Joint Management of Species Committee: Sarah Christie (Corresponding Member); Heather Hall (Member); Nick Lindsay (Member); Paul Pearce-Kelly (Member); Simon Tonge (Member); Doug Richardson (Member).

Conservation and Animal Management Committee: Nick Lindsay (Chairman); Simon Tonge (Member).

Taxon Advisory Groups: Elizabeth Barratt (Member, UK Chiropteran and Insectivore TAG); Clive Bates (Member, UK Stork, Ibis & Spoonbill TAG); Dave Clarke (Member, UK Terrestrial Invertebrate TAG; Chairman, Mollusc Sub-Group; Member, UK Fish & Aquatic Invertebrate TAG); Alexandra Dixon (Member, UK Rhino TAG); Heather Hall (Chairman, UK Reptile TAG; Chairman, Seahorse Conservation Group; Co-Chairman, UK Fish & Aquatic Invertebrate TAG); Brian Harris (Member, UK Fish & Aquatic Invertebrate TAG); Melvin Lear (Member, UK Reptile TAG); Nick Lindsay (Chairman, UK Rhino TAG; Co-Chairman, UK Crane TAG; Member, UK Bovid and Equid TAGs); Duncan McGinnie (Member, UK Fish & Aquatic Invertebrate TAG); Trevor Moxey (Member, UK Terrestrial Invertebrate TAG); Paul Pearce-Kelly (Member, UK Terrestrial Invertebrate TAG; Chairman, Orthoptera Sub-Group); John Pullen (Member, UK Primate TAG); Les Radford (Member, UK Marine Mammal TAG); Andy Reeve (Member, UK Diurnal Raptor TAG); Doug Richardson (Chairman, UK Bovid TAG; Member, UK Small Carnivore, Rodent & Lagomorph, and Monotreme & Marsupial TAGs); Simon Tonge (Chairman, UK Hornbill, Toucan & Turaco TAG; Member, UK Ciconiiform, Falconiform, Parrot, Penguin, Passerine, Pigeon & Reptile TAGs); Esther Wenman (Member, UK Reptile TAG); Frank Wheeler (Corresponding Member, UK Small Carnivore TAG); Andy White (Member, UK Penguin TAG).

Exotic Pet Advisory Committee: Heather Hall (Member).

Friends of Conservation: Morris Gosling (Member, Scientific Advisory Board).

Ghana Wildlife Department: Nick Lindsay (Adviser to Zoo Committee).

Great Bustard Group: Clive Bates.

Institute of Fisheries Management Committee: Heather Hall (Member).

International Species Inventory System: The Zoological Society of London (Corporate Member).

International Species Recovery Committee for the Golden Lion Tamarin: Jo Gipps (Member).

IUCN - World Conservation Union (Species Survival Commission): Elizabeth Barratt (Member, Conservation Breeding Specialist, and Reintroduction Specialist Groups); Michael Bruford (Member, Conservation Breeding Specialist Group); Sarah Christie (Member, Cat and Conservation Breeding Specialist Groups); Andrew Cunningham (Member, Conservation Breeding Specialist Group); Alexandra Dixon (Member, Conservation Breeding, Antelope, Parrot, and

Reintroduction Specialist Groups); Edmund Flach (Member, Veterinary Specialist Group); Jacques Flamand (Antelope, and Veterinary Specialist Groups); Jo Gipps (Member, Steering Committee; Member, Conservation Breeding, Primate, and Reintroduction Specialist Groups); Morris Gosling (Member, Antelope Specialist Group); Richard Kock (Member, Veterinary Specialist Group); Nick Lindsay (Member, Reintroduction, and Insectivore Specialist Groups); Georgina Mace (Member, Steering Committee, and Conservation Breeding and Reintroduction Specialist Groups); Peter Olney (International Studbook Co-ordinator, Conservation Breeding Specialist Group; Emeritus Member, Reintroduction Specialist Group); Paul Pearce-Kelly (Member, Mollusc, and Reintroduction Specialist Groups; Member, Invertebrate Conservation Task Force; Chairman, CBSG Invertebrate Working Group); Doug Richardson (Member, Cat, and Conservation Breeding Specialist Groups); Craig Roberts (Member, Antelope Specialist Group); Tony Sainsbury (Member, Veterinary Specialist Group and Conservation Breeding Specialist Group).

IUCN Declining Amphibian Populations Task Force: Andrew Cunningham (Chair).

Jersey Wildlife Preservation Trust: Georgina Mace (Member, Scientific Advisory Committee)

Journal of Reproduction and Fertility: William Holt (Member, Editorial Board).

Madagascar Fauna Group: The Zoological Society of London (Corporate Member).

Marwell Preservation Trust: Nick Lindsay (Member, Animal Management Committee).

NERC Terrestrial Sciences Peer Review Committee: Georgina Mace (Member).

Pacific Island Land Snail Group: Paul Pearce-Kelly (International Co-ordinator, *Partula* snail programme); Dave Clarke (International Studbook Holder).

Primate Society of Great Britain: Georgina Mace (Council Member).

Royal Veterinary College: Morris Gosling (Council Member).

Society for Conservation Biology: Georgina Mace (Member, Board of Governors).

Thai Society for the Conservation of Wild Animals: Sarah Christie (Adviser).

UK Dependent Territories Conservation Strategy Forum: Alexandra Dixon (Member); Paul Pearce Kelly (Member, Board).

UK Pig Reproduction Research Liaison Group: William Holt (Member).

UK Reef Working Group: Heather Hall (Member).

Veterinary Invertebrate Society: Andrew Cunningham (Council Member).

Wildlife and Countryside Link: Alexandra Dixon (Member, ZSL Representative; Vice-Chairman, Conventions Group).

World Association of Wildlife Veterinarians: Tony Sainsbury (Chairman).

World Pheasant Association: Simon Tonge (Chairman, Conservation Policies and Programmes Committee, to Sept 1998).

Zoo Outreach Organization, India: The Zoological Society of London (Corporate member).

Publications by ZSL Staff and Research Workers

- Abaigar, T., Holt, W. V., Harrison, R. A. P. & del Barrio, G. (1998). Sperm subpopulations in boar (*Sus scrofa*) and gazelle (*Gazella dama mhorr*) semen as revealed by pattern analysis of computer-assisted motility assessments. *Biology of Reproduction* **60**: 32-41.
- Abu Elzein, A. M. E., Sanouka, M. A., Al-Afleq, A. I., Mohammed, O. B. & Flamand, J. R. B. (1998). Arbovirus infections of ruminants in Al-Rub Al-Khali desert. *Veterinary Record* **142**: 196-197.
- Albon, S. D., Coulson, T. N. & Clutton-Brock, T. H. (1998). Demographic constraints in red deer (*Cervus elaphus*): can the past predict the future? *3rd International Congress Biology of Deer* (Edinburgh): 85-95.
- Armbruster, P., Bradshaw, W. E. & Holzapfel, C. M. (1998). Effects of postglacial range expansion on allozyme and quantitative genetic variation of the pitcher-plant mosquito, *Wyeomyia smithii*. *Evolution* **52**: 1697-1704.
- Baker, J. R., Jepson, P. D., Simpson, V. R. & Kuiken, T. (1998). Pathology of grey seals (*Halichoerus grypus*) found dead on the coasts of the U.K. *The Veterinary Record* **142**: 595-601.
- Beaumont, M. A., Ibrahim, K., Boursot, P. & Bruford, M. W. (1998). Measuring genetic distance. In *Molecular Tools for Screening Biodiversity*: 315-325. Karp, A., Isaac, P. G. & Ingram, D. S. (Eds). London: Chapman and Hall.
- Berger, L., Speare, R., Daszak, P., Green, D. E., Cunningham, A. A., Goggin, C. L., Slocumbe, R., Ragan, M. A., Hyatt, A. D., McDonald, K. R., Hines, H. B., Lips, K. R., Marantelli, G. & Parkes, H. (1998). Chytridiomycosis causes amphibian mortality associated with population declines in the rain forests of Australia and Central America. *Proceedings of the National Academy of Sciences USA* **95**: 9031-9036.
- Bertram, B. C. R. & Caro, T. M. (1998). Demography of the Serengeti cheetah (*Acinonyx jubatus*) population: the first 25 years. *Journal of Zoology (London)* **244**: 473-488.
- Blase, N., Fazeli, A. R., Topper, E., Bevers, M. M., Woelders, H., Töpfer-Petersen, E. & Colenbrander, B. (1998). Inhibition of boar sperm binding to homologous zona pellucida by antibodies against ZP3 α and ZP3 β glycoproteins. *Reproduction in Domestic Animals* **33**: 21-25.
- Bourke, A. F. G. & Chan, G. L. (1998). Kin conflicts in the facultatively polygynous ant *Leptothorax acervorum*. In *Social insects at the turn of the millennium*: 72. Schwarz, M. & Hogendoorn, K. (Eds). XIII Congress of IUSSI Inc., Adelaide.
- Bourne, D. (1998). Disease and mortality in Bennett's wallabies (*Macropus rufogriseus rufogriseus*) at Whipsnade Wild Animal Park. Medical conditions and veterinary considerations of zoo animals. *Proceedings of the spring meeting of the BVZS*. June 1997: 9-12.
- Bradshaw, W. E., Armbruster, P. & Holzapfel, C. M. (1998). Fitness consequences of hibernial diapause in the pitcher-plant mosquito, *Wyeomyia smithii*. *Ecology* **79**: 1458-1462.
- Bruford, M. W. & Beaumont, M. A. (1998). Binary data analysis. In *Molecular Tools for Screening Biodiversity*: 329-331. Karp, A., Isaac, P. G. & Ingram, D. S. (Eds). London: Chapman and Hall.
- Bruford, M. W., Ciofi, C. & Funk, S. M. (1998). Characteristics of microsatellites. In *Molecular Tools for Screening Biodiversity*: 202-205. Karp, A., Isaac, P. G. & Ingram, D. S.

- (Eds). London: Chapman and Hall.
- Bruford, M. W., Hanotte, O. & Burke, T. (1998). Multi- and single locus DNA fingerprinting. In *Molecular Analysis of Populations: A Practical Approach*: 287-336. 2nd Edition. Hoelzel, A. R. (Ed.). Oxford: IRL Press.
- Bruford, M. W. & Saccheri, I. J. (1998). DNA fingerprinting with VNTR probes. In *Molecular Tools for Screening Biodiversity*: 99-108. Karp, A., Isaac, P. G. & Ingram, D. S. (Eds). London: Chapman and Hall.
- Buhi, W. C., Alvarez, I. M., Pickard, A. R., Cleaver, B., Diehl, J. R. & Ashworth, C. J. (1998). Comparison of oviductal activity in indigenous (LW) and prolific Chinese Meishan (MS) pigs. *Journal of Reproduction and Fertility Abstract Series* 22: No. 44.
- Burland, T. M., Barratt, E. M. & Racey, P. A. (1998). Isolation and characterisation of microsatellite loci in the brown long-eared bat, *Plecotus auritus*, and cross species amplification within the family Vespertilionidae. *Molecular Ecology* 7: 133-140.
- Butlin, R. K., Walton, C., Monk, K. A. & Bridle, J. R. (1998). Biogeography of Sulawesi grasshoppers, genus *Chitaura* using DNA sequence data. In *Biography and Geological Evolution of south-east Asia*. Hall, R. & Holloway, J. D. (Eds). London: Geographical Society and Backhuys Publishers.
- Carvell, C., Inglis, N. F. J., Mace, G. M. & Purvis, A. (1998). Correspondence. *Nature* 395: 213.
- Cheng, F. P., Fazeli, A. R., Voorhout, W. F., Tremoleda, J. L., Bevers, M. M. & Colenbrander, B. (1998). Progesterone in mare follicular fluid induces the acrosome reaction in stallion spermatozoa and enhances in vitro binding to the zona pellucida. *International Journal of Andrology* 21: 57-66.
- Cheng, F. P., Gadella, B. M., Voorhout, W. F., Fazeli, A. R., Bevers, M. M. & Colenbrander, B. (1998). Progesterone-induced acrosome reaction in stallion spermatozoa is mediated by a plasma membrane progesterone receptor. *Biology of Reproduction* 59: 733-742.
- Christie, S. (1998). *European studbook for tigers*. 3. London: Zoological Society of London.
- Ciofi, C. & Bruford, M. W. (1998). Isolation and characterization of microsatellite loci in the komodo dragon *Varanus komodoensis*. *Molecular Ecology* 7: 134-136.
- Ciofi, C., Funk, S. M., Coote, T., Cheesman, D. J., Hammond, R. L., Saccheri, I. J. & Bruford, M. W. (1998). Genotyping with microsatellite markers. In *Molecular Tools for Screening Biodiversity*: 202-205. Karp, A., Isaac, P. G. & Ingram, D. S. (Eds). London: Chapman and Hall.
- Clark, K. M., Carroll, J. B., Clark, M., Garrett, S. R. T., Pinkus, S. & Saw, R. (1998). Capture and survey of Livingstone's fruit bat *Pteropus livingstonii* in the Comoros Islands: the 1995 expedition. *Dodo* 33: 20-35.
- Clark, M. (1998). The mongoose lemur *Eulemur mongoz* on Anjouan, Comoros. *Dodo* 33: 36-44.
- Clarke, D., Burlingham-Johnson, A. & Pearce-Kelly, P. (1998). A colony management and analysis database relevant for mollusc conservation. *Journal of Conchology (special publication)* 2: 97-100.
- Clauss, M., Deutsch, A., Lechner-Doll, M., Flach, E. & Tack, C. (1998). Passage rate of fluid and particle phase in captive giraffe (*Giraffa camelopardis*). Nutrition and Digestive Physiology. *Proceedings of 2nd International Symposium on Physiology and Ethology of Wild and Zoo Animals (Berlin)*. October 1998: 98.
- Coulson, T. N., Pemberton, J. M., Albon, S. D., Beaumont, M., Marshall, T. C., Slate, J., Guinness, F. E. & Clutton-Brock, T. H. (1998). Microsatellites measure inbreeding depression and heterosis in red deer. *Proceedings of the Royal Society of London, Series B* 265: 489-495.
- Coulson, T. N., Pemberton, J. M., Albon, S. D., Slate, J., Guinness, F. E. & Clutton-Brock, T. H. (1998). Genotype by environment interactions in winter survival in red deer. *Journal of Animal Ecology* 67: 434-445.
- Cowlshaw, G. (1998). The role of vigilance in the survival and reproductive strategies of desert baboons. *Behaviour* 135: 431-452.
- Cowlshaw, G. & Hacker, J. E. (1998). Too much latitude for Rapoport's rule? *Trends in Ecology and Evolution* 13: 241-242.
- Cunningham, A. A. & Daszak, P. (1998). Extinction of a species of land snail due to infection with a microsporidian parasite. *Conservation Biology* 12: 1139-1141.
- Cunningham, A. A. & Dillon, A. P. (1998). Pleural malignant mesothelioma in a captive clouded leopard (*Neofelis nebulosa nebulosa*). *The Veterinary Record* 143: 22-24.
- Daszak, P. & Cunningham, A. A. (1998). Wildlife disease biology comes of age. *Orxy* 32(4): 238-239.
- Daszak, P. & Cunningham, A. A. (1998). "Maladaptation syndrome" and captive reptiles. Medical conditions and veterinary considerations of zoo animals. *Proceedings of the spring meeting of the BVZS*. June 1997: 7-8.
- Du Boulay, G. H. (1998). The story of the internal carotid artery of mammals: from Galen to sudden infant death syndrome. *Neuroradiology* 40: 697-703.
- Dunham, K. M. (1998). Spatial organisation of mountain gazelles *Gazella gazella* reintroduced to Central Arabia. *Journal of Zoology (London)* 245: 371-384.
- Durant, S. M. (1998). Competition refuges and coexistence: An example from Serengeti carnivores. *Journal of Animal Ecology* 67: 370-386.
- Durant, S. M. (1998). A minimum intervention approach to conservation: The influence of social structure. In *Behavioural Ecology and Conservation Biology*: 105-129. Caro, T. M. (Ed.). Oxford: Oxford University Press.
- Fisher, M. Ghazanfar, S. A., Chaudhary, S. A., Seddon, P., Robertson, E. F., Omar, S., Abbas, J. A. & Boer, B. (1998). Diversity and conservation. In *Vegetation of the Arabian Peninsula*: 265-302. Ghazanfar & Fisher (Eds). The Netherlands: Kluwer Academic Publ.
- Flach, E. (1998). Routine use of RX821002A (Methoxyidazoxan) to antagonise xylazine in zoo mammals. *Proceedings of the EAAZW (Chester)*. May 1998: 133-138.
- Flach, E. J., Furrokh, I. K., MacGregor, S. K., Cunningham, A. A. & Kirkwood, J. K. (1998). Salmonellosis due to *Salmonella enteritidis* infection in a group of Przewalski's horses (*Equus przewalskii*). *Proceedings of the spring meeting of the BVZS*. June 1997: 38-41.
- Flach, E. J., Furrokh, I. K., Thornton, S. M., Smith, J., Parkyn, J. P. & Campbell, E. J. (1998). Caesarian section in a pygmy hippopotamus (*Choeropsis liberiensis*) and the management of the wound. *The Veterinary Record* 143: 611-613.
- Flach, E. J., Thornton, S. M., Kirkwood, J. K. & Sainsbury, A. W. (1998). Chronic loss of condition with persistent neutrophilia in a reticulated giraffe (*Giraffa camelopardalis*). Medical conditions & veterinary considerations of zoo animals. *Proceedings of the spring meeting of the BVZS*. June 1997: 33-37.
- Frölich, K. & Flach, E. J. (1998). Long-term viral serology of semi-free-living and captive ungulates. *Journal of Zoo and Wildlife Medicine* 29: 165-170.
- Gibson, D., Harris, E. A., Bray, R. A., Jepson, P. D., Kuiken, T., Baker, J. R. & Simpson, V. R. (1998). A survey of the helminth of parasites of cetaceans stranded on the coast of England and Wales during the period 1990-1994. *Journal of Zoology (London)* 244: 563-574.
- Grenfell, B. T., Wilson, K., Finkenstädt, B. F., Coulson, T. N.,

- Murray, S., Albon, S. D., Pemberton, J. M., Clutton-Brock, T. H. & Crawley, M. J. (1998). Noise and determinism in synchronised sheep dynamics. *Nature* **394**: 674-677.
- Hacker, J. E., Cowlishaw, G. & Williams, P. H. (1998). Patterns of African primate diversity and their evaluation for the selection of conservation areas. *Biological Conservation* **84**: 251-262.
- Hammond, R. L., Saccheri, I. J., Ciofi, C., Coote, T., Funk, S. M., McMillan, W. O., Bayes, M. K., Taylor, E. & Bruford, M. W. (1998). Isolation of microsatellite markers in animals. In *Molecular Tools for Screening Biodiversity*: 279-285. Karp, A., Isaac, P. G. & Ingram, D. S. (Eds). London: Chapman and Hall.
- Hatt, J.-M. & Sainsbury, A.W. (1998). Unusual case of metabolic bone disease in a common marmoset (*Callithrix jacchus*). *The Veterinary Record* **143**: 78-80.
- Hobbs, J. J., Grainger, J. & El-Bastawisi, I. Y. (1998). Inception of the Bedouin programme in the St Katherine Natural Protectorate, Sinai, Egypt. *Mountain Research and Development* **18**: 135-248.
- Holt, W. V. (1998). The roles of cryobiology and reproductive technology in the conservation of biodiversity. *Cryoletters Suppl* **1**: 47-56.
- Holt, W. V. (1998). Cryopreservation of human spermatozoa for donor insemination: problems, principles and research recommendations. In *Evidence-based Fertility Treatment*: 135-147. Templeton, A., Cooke, I. & Shaughn O'Brien, P. M. (Eds). RCOG Press.
- Jepson, P. D. & Baker, J. R. (1998). Bottlenose dolphins (*Tursiops truncatus*) as a possible cause of acute traumatic injuries in porpoises (*Phocoena phocoena*). *The Veterinary Record* **143**: 614-615.
- Jepson, P. D., Bennett, P. M., Allchin, C. R., Baker, J. R., Kuiken, T., Rogan, E., Lockyer, C., Law, R. J., Walton, M. J. & Kirkwood, J. K. (1998). Chronic PCB exposure is associated with infectious disease mortality in harbour porpoises stranded in England and Wales 1990-1996. *Proceedings of the first World Marine Mammal Science Conference (Monaco)*.
- Jordan, W. C. & Bruford, M. W. (1998). New perspectives on mate choice and the MHC. *Heredity* **81**: 127-133.
- Jordan, W. C., Foley, K. A. & Bruford, M. W. (1998). Single-strand conformation polymorphism (SSCP) analysis. In *Molecular Tools for Screening Biodiversity*: 152-156. Karp, A., Isaac, P. G. & Ingram, D. S. (Eds) London: Chapman and Hall.
- Kelly, M. J., Laurenson, M. K., Fitzgibbon, C. D., Collins, D. A., Durant, S. M., Frame, G. W., Bertram, B. C R, Caro T M (1998). Demography of the Serengeti cheetah (*Acinonyx jubatus*) population: the first 25 years. *Journal of Zoology (London)* **244**: 473-488.
- Lister, A. M., Kadwell, M., Kaagan, L. M., Jordan, W. C., Richards, M. B. & Stanley, H. F. (1998). Ancient and modern DNA in a study of horse domestication. *Ancient Biomolecules* **2**: 267-280.
- Macdonald, D. W., Mace, G. M. & Rushton, S. (1998). Proposals for the future monitoring of British mammals. *DETR/JNCC Publication*.
- Mace, G. M. (1998). Getting the measure of extinction. *People and Planet* **7**: 9.
- Mace, G. M., Christie, S., Wilken, J. & Williams, S. D. (1998). Inbreeding in pedigreed populations of tigers and racehorses. *Abstracts of the 1998 Annual Meeting of the Genetical Society of Australia*.
- Mace, G. M. & Kershaw, M. (1998). Extinction risk and rarity on an ecological timescale. In *The biology of rarity*: 131-149. Kunin, W. E. & Gaston, K. J. (Eds). London: Chapman and Hall.
- Mace, G. M., Pearce-Kelly, P. & Clarke, D. (1998). An integrated conservation programme for the tree snails of Polynesia: a review of captive and wild elements. *Journal of Conchology (special publication)* **2**: 89-96.
- Monk, K. A. (1998). Saving Sumatra. *International Conservation Update. Lifewatch* (Spring): 10-11.
- Morrell, J. M., Nubbemeyer, R., Heistermann, M., Rosenbusch, J., Küderling, I., Holt, W., Hodges, J. K. (1998). Artificial insemination in *Callithrix jacchus* using fresh or cryopreserved sperm. *Animal Reproduction Science* **52**: 165-174.
- O'Ryan, C., Harley, E. H., Bruford, M. W., Beaumont, M. A., Wayne, R. K., Cherry, M. I. (1998). Microsatellite analysis of genetic diversity in fragmented South African buffalo populations. *Animal Conservation* **1**: 85-94.
- Pearce-Kelly, P., Jones, R., Clarke, D., Walker, C., Atkin, P. & Cunningham, A. A. (1998). The captive rearing of threatened Orthoptera: a comparison of the conservation potential and practical considerations of two species' breeding programmes at the Zoological Society of London. *Journal of Insect Conservation* **2**: 201-210.
- Pemberton, J. M., Smith, J. A., Coulson, T. N., Marshall, T. C., Slate, J., Paterson, S., Albon, S. D. & Clutton-Brock, T. H. (1998). The maintenance of genetic polymorphism in small island populations: large mammals in the Hebrides. In *Evolution in Islands*: 51-66. Grant, P. E. (Ed.). Oxford: Oxford University Press.
- Penfold, L. M., Holt, C., Holt, W. V., Welch, G. R., Cran, D. G. & Johnson, L. A. (1998). Comparative motility of X and Y chromosome-bearing bovine sperm separated on the basis of DNA content by flow sorting. *Molecular Reproduction and Development* **50**: 323-327.
- Pickard, A. R. (1998). Reproduction in the Red Panda: investigations into the control of reproduction and the development of technologies to support the captive breeding programme. In *Red or Lesser Panda Studbook* **10**: 5-7. Glatston, A. R. (Ed.). Netherlands: Rotterdam Zoo.
- Pickard, A. R., Abaigar, T., Holt, W. V. & Cano, M. (1998). Effects of oestrus synchronisation on Mohor gazelle fertility, studied by faecal steroid excretion. *Journal of Reproduction and Fertility Abstract Series* **22**: No.64.
- Porteous, I. S. & Pankhurst, S. J. (1998). Social structure of the mara (*Dolichotis patagonum*) as a determinant of gastrointestinal parasitism. *Parasitology* **116**: 269-275.
- Rachlow, J. L., Berkeley, E. V. & Berger, B. (1998). Correlates of male mating strategies in white rhinos (*Certotherium simum*). *Journal of Mammalogy* **79**: 1317-1324.
- Rachlow, J. L. & Berger, B. (1998). Reproduction and population density: Trade-offs for the conservation of rhinos *in situ*. *Animal Conservation* **1**: 101-106.
- Rachlow, J. L. & Bowyer, R. T. (1998). Habitat selection by Dall's sheep (*Ovis dalli*): maternal trade-offs. *Journal of Zoology (London)* **245**: 457-465.
- Roberts, S. C. (1998). Long-term costs of the mopane worm harvest. *Oryx* **32**: 6-8.
- Roberts, S. C. (1998). Behavioural responses to scent marks of increasing age in klipspringer *Oreotagus oreotragus*. *Ethology* **104**: 585-592.
- Sablitzky, F., Moore, A., Bromley, M., Deed, R. W., Newton, J. S. & Norton, J. D. (1998). Stage- and subcellular-specific expression of Id proteins in male germ and sertoli cells implicates distinctive regulatory roles for Id proteins during meiosis, spermatogenesis, and sertoli cell function. *Cell Growth & Differentiation* **9**: 1015-1024.
- Sainsbury, A. W., Fox, M. T. & Kirkwood, J. K. (1998). Postgraduate education in zoo and wildlife veterinary science: the Master of Science Course in Wild Animal

- Health at London. In *Proceedings of the American Association of Zoo Veterinarians and the American Association of Wildlife Veterinarians*: 253-257. Kirk Baer, C. (Ed.). Omaha.
- Sainsbury, A. W., Fox, M. T. & Kirkwood, J. K. (1998). The Master of Science Course in Wild Animal Health - The First Three Years. *European Association of Zoo and Wildlife Veterinarians Second Scientific Meeting (Chester)*. May 21-24: 455-458.
- Sainsbury, A. W. & Gurnell, J. (1998). The health of red squirrels (*Sciurus vulgaris*) in translocation studies. In *Proceedings of the American Association of Zoo Veterinarians and the American Association of Wildlife Veterinarians*: 416. Kirk Baer, C. (Ed.). Omaha.
- Scheffrahn, W., Tomiuk, J., Bayes, M. (1998). Workshop: Population Genetics and Conservation Biology in non-Human Primates. *Folia Primatologica* 69 (Suppl 1): 117-120.
- Semple, S. (1998). The function of Barbary macaque copulation calls. *Proceedings of the Royal Society of London, Series B* 265: 287-291.
- Simmons, R. E., Stander, P. E., Barnard, P. & Cowlshaw, G. (1998). The role of behavioural ecology in southern Africa. *South African Journal of Science* 93: 489-490.
- Thornton, S. M., Nolan, S. & Gulland, F. M. D. (1998). Bacterial isolates from California sea lions (*Zalophus californianus*), harbor seals (*Phoca vitulina*), and Northern elephant seals (*Mirounga angustirostris*) admitted to a rehabilitation center along the central California coast, 1994-1995. *Journal of Zoo and Wildlife Medicine* 29(2): 171-176.
- Thurston, L. M., Holt, W. V. & Watson, P. F. (1998). Computer assisted morphology analysis of boar sperm sub-populations. *Journal of Reproduction and Fertility Abstract Series* 22.
- Tonge, S. & Wilkinson, R. (1998). Captive breeding, conservation and science—a report on the Workshop held at the WPA Galliforme Symposium, Kuala Tahan, Malaysia, 12 September 1997. *WPA News* 55: 13-17.
- Van Bresse, M. F., Jepson, P. D. & Barrett, T. (1998). Further insight on the epidemiology of cetacean morbillivirus in the northeastern Atlantic. *Marine Mammal Science* 14: 605-613.
- Vitaud, C., Flach, E. J., Thornton, S. M. & Capello, R. (1998). Clinical observations in four cases of feline spongiform encephalopathy in cheetahs (*Acinonyx jubatus*). *European Association of Zoo and Wildlife Veterinarians Second Scientific Meeting (Chester)*. May 21-24: 133-138.
- Von-Houwald, F. & Flach, E. J. (1998). Prevalence of chronic foot disease in captive greater one-horned rhinoceros (*Rhinoceros unicornis*). *European Association of Zoo and Wildlife Veterinarians Second Scientific Meeting (Chester)*. May 21-24: 323-327.
- Wacher, T. (1998). Great white hope. *BBC Wildlife* 16: 62-69.
- Wacher, T. & Kichenside, C. (1998). Reintroducing the sand gazelle *Gazella subgutturosa* to Uruq Bani Ma'arid Protected Area: Empty Quarter of Saudi Arabia *Reintroduction News*. 15: 10-12.
- Warmolts, D., Vincent, A. & Hall, H. (1998). Seahorse conservation and management in Vietnam (a project seahorse initiative). *Conservation Newsletter* 3: 11-12.
- Williams, S. D. & Ginsberg, J. R. (1998). Grave time for Grevy's zebra. *Natural History* 107 (2).

Donations and legacies

We are extremely grateful for the many generous donations received in 1998. Donors included:

Corporate Sponsors and donors to ZSL in 1998

3M
 Abbey National
 Amex Travel Insurance
 Argos
 ATEC
 Benham Business Group
 British Airways
 Brook Hansen
 Casio Electronics Co. Ltd
 Cathay Pacific
 Compuadd
 Dow Construction Products
 Esso UK Ltd
 First Choice
 Henderson Administration Group Ltd
 Hewlett Packard
 Hoopoes Ltd
 Hunt Graphics
 Karcher
 Kenya Airways
 Kleinwort Benson
 Kodak
 London Electricity
 Merlin Interiors
 Microsoft
 Mitsubishi Corporation (UK) Ltd
 Nestle UK Ltd
 Parker Pens
 RES
 Robert Horne
 Robot Coupe
 Smithkline Beecham PLC
 Spandex
 Spur Shelving
 Tellabs
 Thames Water Utilities
 Twinings
 Volvo
 Yellow Pages

Charitable Trusts

Arthur Anderson Foundation
 Cadogan Charity
 Cairns Charitable Trust
 Donald Forrester Trust
 Haberdashers' Company
 J & H Marsh & McLennan
 Kleinwort Benson
 The John Spedan Lewis Foundation
 The Lyrus Family Charitable Trust
 The Mercer's Company
 The Millennium Commission
 The Steel Charitable Trust

Legacies

E. A. C. Darker
E. Davis
A. I. Ferguson
Mrs F. R. Ham
Harry P. Harfield
John Kennewell
Mr F. C. Minns
A. B. Partridge
Dorothy Price
Christine Risebero
Evelyn Maud Stevens
W. Swindon
Florence Valvona
M. F. Warricker
Lilian Weir

If you would like to make a donation to the Society or to remember it in your Will, please ask the ZSL Fundraiser (Tel. 0171 449 6226) to give you details.

Animal Collection Report

Compared with 1997 there were fewer major building projects at either site. The only large development was the new hippo complex at Whipsnade, which houses all common and pygmy hippos together under one roof and has excellent public viewing areas and extended paddocks to the outside pools. New indoor areas were also created for the greater Asian one-horned rhinos at Whipsnade and these are attached to three large paddocks which can be viewed by car, on foot and from the railway.

At Regent's Park the largest development was the conversion of the Three Island Pond to hold both pelicans and flamingos. The latter had been moved from the pond roughly ten years ago, in order to try to re-stimulate breeding in the flock. This has proved unsuccessful and it was thought that a return to the Three Island Pond, where the flock used to breed regularly, might provide the stimulus required. The Clock Tower Aviary near Barclay Court was converted to house a pair of red-ruffed lemurs and it is hoped that they will breed during 1999.

The other end of the scale, both in size and budget, saw a change in use of the video room in the Discovery Centre at Whipsnade to what is now known as the Conservation Room. This will provide excellent facilities for Whipsnade to join London in managing Lake Victoria cichlids, seahorses, *Partula* snails and other threatened species. Development of this area was made possible through the endeavours of the staff of the Discovery Centre, who enlisted considerable support in materials and equipment from the local business community.

At London, the most significant births were two sloth bear cubs, born in January. One did not survive, but the other, a male, could be seen by visitors just before Easter. His mother's behaviour changed drastically and the stereotypic behaviour which she showed when she arrived from her previous home was greatly reduced. However, she became aggressive to a number of other animals in

the enclosure, with the result that one muntjac was killed and the other had to be removed. Despite this, it was possible to keep the male bear with the female and cub and they proved to be a good exhibit throughout the summer.

At Whipsnade two pygmy hippos were born towards the end of the year. One was produced by 'Valenta', who had undergone a caesarean section three years ago. Unfortunately she did not survive a second caesarean, but the female calf was hand-reared and is progressing well.

The red pandas at both sites bred and the Whipsnade pair succeeded in rearing a youngster. It was the first birth for the London pair and the youngsters did not survive past two days of age. A female anoa calf was born and successfully reared at Regent's Park, although the mother tended to over-groom the calf and when it first emerged into the paddock it appeared somewhat bald. In the Clore Pavilion, the pottos that arrived during 1997 produced their first infant, which grew rapidly and by the end of the year had been sent on a breeding loan to Rotterdam Zoo.

Many species of bird bred successfully during the year. At Whipsnade, the pair of Stanley cranes produced four chicks from three clutches and the red-crowned cranes at London hatched two chicks, but unusually both died within two days from aspergillosis. The real success, however, was hatching a Brolga crane at Whipsnade following the use of artificial insemination. This pair had bred only twice previously in the last twenty years or so. Artificial insemination in cranes could prove invaluable in the future and this is a very encouraging start. Three Caribbean flamingo chicks were parent-reared at Whipsnade and were joined later in the season by a hand-reared greater flamingo chick. The egg, which was laid at Flamingo Gardens, in Olney, in the Society's flock held at that collection, hatched in an incubator after the parent birds had rejected it.

Hand-rearing skills were also used when four painted stork eggs were received from Thrigby Hall following a late laying of a second clutch. With poor weather expected, Whipsnade took the eggs for incubation and one chick hatched. Unfortunately, despite a promising start, the chick died at a few weeks of age. Hand-rearing at Regent's Park resulted in the first ever successful rearing of a superb fruit dove by hand. Pigeons and doves are extremely difficult to rear artificially because the parent birds produce a crop milk that is hard to simulate. The Bird House staff prepared an artificial diet, and a male chick was successfully fledged three weeks later. Late in the year a Moluccan cockatoo hatched in an incubator. At the end of the year the chick was being successfully reared using puppets to avoid any risk of imprinting on keepers.

The West African dwarf crocodiles bred in the new large enclosure at Whipsnade for the first time. Previous years had seen plenty of eggs produced, but they had always proved infertile. This year four young were hatched. Tortoises were bred at both sites, with Hermann's and Kleinmann's breeding at Whipsnade and Kleinmann's and pancake breeding at Regent's Park.

The conservation programme for threatened invertebrates from Fregate Island in the Seychelles

developed well. By the year-end, there were 60 F₁ Frigate beetles, 700 great millipedes and 104 Frigate Enid snails awaiting transfer to the new *Web of Life* exhibit in the Millennium Conservation Centre.

By the end of the year there were no lions in the collection at Whipsnade following the death of the single remaining female at the age of twenty. The female gaur 'Gretel' also died and the death of 'Othelo', a Przewalski horse stallion imported from Germany earlier in the year, was a setback, but it is hoped that he had already sired a number of foals for 1999.

At Regent's Park the adult male giraffe 'Hilary' died at the age of twenty-three. He was born in the Zoo in 1975. The Zoo's oldest animal, the great Indian hornbill, 'Josephine' who came to Regent's Park in 1951, was euthanased in November.

Probably the most significant animal moves during the year involved rhinos. The two young Asian one-horned rhinos from Nepal were transferred from London to Whipsnade in the Autumn. The male black rhino at Whipsnade, 'Kati Kati' was exchanged with Chester Zoo for 'Quinto', originally born in Zurich. This move was part of the EEP for this critically endangered species and it is hoped that two new breeding pairs will have been established as a result.

The group of greater Kudu at Regent's Park was transferred to the Institute of Zoology facility at Whipsnade, where the health status of the animals will continue to be monitored under more controlled conditions. Their London Zoo paddock was converted to hold four male rheas from Marwell Zoo which will eventually be moved to the paddock alongside *Web of Life*. A young male giant anteater, from Dortmund Zoo, will also be housed in this enclosure; he is currently being quarantined in the Clore Pavilion and a female is due to arrive from Santa Barbara Zoo, California. It is almost ten years since this remarkable species was in the collection at Regent's Park and it is hoped that we will be able to establish a breeding group in our new purpose-built facility.

Whipsnade assembled a herd of one male and three female Przewalski's horses, including one from the Whipsnade herd, for health checks prior to their transfer to Hungary to join a grassland management programme in Hortobagy National Park. This herd will join two others already established in the grasslands as part of an exciting project using the particular grazing strategies of the Przewalski's horse to assist in the management of this important habitat.

In collaboration with English Nature, another release of English field crickets bred in the Invertebrate House at Regent's Park was carried out at sites in southern England; over four thousand animals were returned to the wild.

A group of Lake Victoria velvet black cichlids from Chester Zoo was bred successfully at London and a group was later transferred to Whipsnade. If this colony breeds, we plan to link with the University of Luton and use their skills in cryopreservation of fish embryos to develop strategies for the conservation of this and many other fish species. The Aquarium also received three pairs of

Knysna seahorses from South Africa. This species seems better able to tolerate the water systems in the Aquarium and by the end of the year over forty offspring had been born.

To encourage breeding in the London Zoo gorilla group, which has not reproduced in ten years, the male 'Jeremiah' was transferred to Belfast Zoo and a new male 'Jomie' was received from Port Lympne. Unfortunately the project received a setback when it was discovered that 'Jomie' was carrying Hepatitis B and his introduction to the females was delayed while they were immunised against the disease. To increase space for the gorillas, nine chimpanzees were transferred to Dudley Zoo to form a new group. Two older females were received in return and these were introduced to the remaining elderly pair at London. The four chimpanzees were then transferred to the former gorilla enclosure.

Several bird species were added to the collections. Perhaps the most significant was a group of eight Dalmatian pelicans from Villars les Dombes, France. These birds were quarantined at Whipsnade before being transferred to Regent's Park where they are housed with the group of white pelicans. In summer both species will be housed on Three Island Pond, where it is hoped that breeding may start. Other additions to the collections include a golden eagle for the flying bird demonstration at Whipsnade and Chinese pond herons, pope cardinals, and red-tailed Amazons at Regent's Park.

ZSL's contribution to Species Management within the UK and Europe is second to none. At the year-end Society staff chaired three European and eight UK Taxon Advisory Groups, and held two international, eight European and three UK studbooks.

Dr Heather Hall participated in a fish TAG expedition to Mexico, searching, successfully, for endangered live-bearing fishes. She also carried out field work on seahorses in the Philippines, and organised a seahorse management workshop at the Shedd Aquarium in Chicago. Dave Clarke and Trevor Coote carried out further field work on *Partula* snails on Tahiti and a new strategy for the conservation of these snails will be developed during 1999. Esther Wenman carried out field work on Kleinmann's tortoise in Egypt, culminating in the trial reintroduction of ten specimens onto a small island in the Zaranik protected area in the north of the country.

By the year-end much of the work at Regent's Park was concentrated on the development of *Web of Life* which will illustrate the nature of biodiversity and its conservation, and provide a new base for the Zoo's invertebrate conservation work. New species such as robber crabs (from Diego Garcia in the Indian Ocean), domino beetles, desert beetles, dung beetles and giant millipedes have been received, and the holding vivaria and aquaria for other unusual species such as giant wetas, freshwater mussels and mole-rats are under construction. At Whipsnade, the penguin exhibit has been completely redesigned and construction should be complete well before Easter 1999.

Simon Tonge, Senior Curator, London Zoo, and Nick Lindsay, Curator, Whipsnade Wild Animal Park

ANIMALS IN THE COLLECTIONS

Key to columns for Mammals, Birds, Reptiles, Amphibians and Fishes:

column 1	Number of animals in the Collection at 1st January 1998.
column 2	Number of animals received in 1998 by presentation, exchange, purchase, or transfer between the Society's two Collections. The figures in brackets indicate animals which have been so transferred.
column 3	Number of animals born or hatched during 1998.
column 4	Number of animals which died in 1998 within 30 days of birth or hatching. The figures in brackets indicate animals born or hatched during December 1997 which died during January 1998. Stillbirths are not included.
column 5	Number of animals which died during 1998, apart from those included in column 4.
column 6	Number of animals disposed of in 1998 by presentation, exchange, deposit, sale or transfer between the Society's two Collections. The figures in brackets indicate animals which have been transferred between the two Collections.
column 7	Number of animals in the Collection at 31st December 1998 showing sexes where these are known, e.g. 1/3/1 indicates 1 male, 3 female, 1 sex unknown.

Key

G	Genus new to the Collection	Species subject to the Agreement with the Marwell Preservation Trust on joint ownership and management	Free-ranging animals at Whipsnade censused once a year
S	Species new to the Collection		
SS	Sub-species new to the Collection		
RT	Regionally threatened (species held in a breeding programme)		

IUCN threatened species categories

1996 IUCN Red List of Threatened Animals. Compiled and edited by Jonathan Baillie and Brian Groombridge. IUCN, Gland, Switzerland

EX	Extinct	CR	Critically Endangered	VU	Vulnerable
EW	Extinct in the Wild	EN	Endangered		

LONDON ZOO

MAMMALS

Monotremata

<i>Tachyglossus aculeatus</i>	Australian Echidna	2	-	-	-	1	-	1/0
-------------------------------	--------------------	---	---	---	---	---	---	-----

Dasyuromorphia

<i>Dasymercus byrnei</i> (VU)	Byrne's Pouched Mouse (Kowari)	8	-	-	-	4	-	2/2
<i>Dactylopsila trivirgata</i>	Striped Possum	5	-	-	-	-	-	2/3
<i>Gymnobelideus leadbeateri</i> (EN)	Leadbeater's Possum	2	-	-	-	1	-	0/1

Diprotodontia

<i>Macropus rufogriseus fruticosa</i>	Red-necked (Bennett's) Wallaby	3	-	1	-	-	2	1/1
<i>Bettongia penicillata</i>	Brush-tailed Bettong	6	-	-	-	1	-	3/2

Macroscelidea

<i>Macroscelides proboscideus</i> (VU)	Short-eared Elephant Shrew	2	7	2	-	3	-	3/3/2
----------------------------------------	----------------------------	---	---	---	---	---	---	-------

Chiroptera

<i>Pteropus rodricensis</i> (CR)	Rodrigues Fruit Bat	30	-	13	4	3	-	22/14
<i>Carollia perspicillata</i>	Seba's Short-tailed Bat	>350	-	20	5	129	116	~120

Scandentia

<i>Tupaia minor</i>	Pygmy Tree Shrew	2	-	1	1	1	-	0/1
<i>Tupaia tana</i>	Large Tree Shrew	4	-	4	2	1	-	1/2/2

Primates

<i>Varecia variegata variegata</i> (EN)	Black-&-white Ruffed Lemur	1	-	-	-	-	-	0/1
<i>Varecia variegata rubra</i> (CR)	Red Ruffed Lemur	2	2(2)	-	-	-	-	2/2
<i>Cheirogaleus medius</i>	Fat-tailed Dwarf Lemur	7	-	1	-	-	3	2/2/1
<i>Hapalemur griseus alaotrensis</i> (CR) SS	Alaotran Gentle Lemur	-	3	-	-	-	-	2/1
<i>Loris tardigradus</i> (VU)	Slender Loris	5	-	-	-	1	-	3/1
<i>Nycticebus coucang</i>	Slow Loris	5	1	-	-	-	-	2/4
<i>Nycticebus pygmaeus</i> (VU)	Pygmy Slow Loris	4	1	-	-	-	1	2/2
<i>Perodicticus potto</i>	Potto	2	-	1	-	-	1	1/1
<i>Galago senegalensis</i>	Senegal Bushbaby	5	-	5	2	-	2	4/1/1
<i>Aotus lemurinus griseimembra</i>	Douroucouli	4	1	-	-	1	2	1/1
<i>Pithecia pithecia</i>	White-faced Saki Monkey	5	1	-	-	1	1	2/2
<i>Ateles paniscus</i>	Red-faced Black Spider Monkey	4	-	-	-	-	-	2/2
<i>Callithrix jacchus</i>	Common Marmoset	12	-	3	-	-	5	7/3
<i>Callithrix geoffroyi</i> (VU)	Geoffroy's Marmoset	3	1	1	1	1	-	2/1
<i>Callithrix argentata argentata</i>	Silvery Marmoset	4	1	-	-	-	3	1/1
<i>Callithrix pygmaea</i>	Pygmy Marmoset	4	1	4	2	-	1	2/2/2
<i>Saguinus oedipus</i> (EN)	Cotton-headed Tamarin	4	-	-	-	-	-	3/1
<i>Saguinus imperator subgriseus</i>	Emperor Tamarin	2	-	1	-	-	-	1/2
<i>Leontopithecus rosalia</i> (CR)	Golden Lion Tamarin	10	-	2	-	-	1	6/3/2
<i>Leontopithecus chrysomelas</i> (EN)	Golden-headed Lion Tamarin	4	1	-	-	-	1	3/1
<i>Callimico goeldii</i> (VU)	Goeldi's Monkey	5	-	2	1	-	-	2/4
<i>Macaca nigra</i> (EN)	Sulawesi Crested Macaque	6	-	3	2	-	-	2/5
<i>Cercopithecus campbelli</i>	Campbell's Guenon	5	-	-	-	-	5	-
<i>Cercopithecus diana diana</i> (VU)	Diana Monkey	2	-	-	-	-	-	1/1
<i>Cercopithecus hamlyni</i>	Hamlyn's Owl-faced Monkey	4	-	-	-	1	1	1/1
<i>Semnopithecus entellus thersites</i>	Hanuman Langur	12	-	4	-	-	-	6/6/4
<i>Hylobates gabriellae</i> (EN)	Buff-cheeked Gibbon	1	-	-	-	-	-	0/1
<i>Hylobates leucogenys leucogenys</i> (EN)	White-cheeked Gibbon	1	-	-	-	-	-	1/0
<i>Hylobates leucogenys siki</i> (EN)	White-cheeked (Siki) Gibbon	2	-	-	-	-	-	1/1
<i>Hylobates lar</i>	Lar Gibbon	3	-	-	-	-	-	1/2
<i>Pan troglodytes</i> (EN)	Chimpanzee	11	2	-	-	-	9	1/3
<i>Gorilla gorilla gorilla</i> (EN)	Western Lowland Gorilla	3	1	-	-	-	1	1/2

Xenarthra

<i>Choloepus didactylus</i>	Two-toed Sloth	2	-	-	-	-	-	1/1
<i>Myrmecophaga tridactyla</i> (VU)	Giant Anteater	-	1	-	-	-	-	1/0

Rodentia

<i>Sciurus stramineus neboxii</i>	White-naped Squirrel	3	-	-	-	-	-	1/2
<i>Sciurus vulgaris</i> (RT)	Red Squirrel	2	-	-	-	1	1	-
<i>Callosciurus prevostii</i>	Prevost's Squirrel	2	-	6	2	-	-	4/2
<i>Tamias sibiricus</i>	Siberian Chipmunk	1	-	-	-	-	-	0/1
<i>Jaculus orientalis</i>	Greater Egyptian Jerboa	4	-	3	2	2	1	1/1
<i>Hypogeomys antimena</i> (EN)	Malagasy Giant Jumping Rat	11	-	2	1	8	-	1/3
<i>Clethrionomys glareolus caesarius</i>	Jersey Vole	~20	-	31	5	5	15	~26
<i>Alticola semicanus</i>	High Mountain Vole	4	-	2	2	3	-	1/0

		1	2	3	4	5	6	7
<i>Gerbillus perpallidus</i>	Pallid Gerbil	1	-	-	-	-	1	-
<i>Micromys minutus</i>	Harvest Mouse	7	-	64	3	16	37	-15
<i>Lemniscomys barbarus</i>	Striped Grass Mouse	-22	-	10	-	32	-	-
<i>Acomys cahirinus</i>	Egyptian Spiny Mouse	-18	-	61	1	41	19	-18
<i>Mus minutoides</i>	Pygmy Mouse	6	-	-	-	4	-	1/1
<i>Rattus rattus</i>	Black Rat	-60	-	244	-	191	28	-85
<i>Notomys alexis</i>	Spinifex Hopping Mouse	6	-	1	-	2	-	2/3
<i>Muscardinus avelanarius</i> (RT)	Common Dromose	6	11	10	-	8	-	8/11
<i>Coendou prehensilis</i>	Prehensile-tailed Tree Porcupine	2	-	-	-	-	2	-
<i>Hystrix africaeaustralis</i>	Cape Crested Porcupine	4	-	4	-	-	8	-
<i>Atherurus africanus</i>	African Brush-tailed Porcupine	5	-	-	-	-	3	1/1
<i>Dasyprocta punctata</i>	South American Agouti	7	-	6	4	-	2	1/3/3
<i>Myoprocta acouchy</i>	Green Acouchi	8	-	2	1	-	3	3/2/1
<i>Chinchilla laniger</i>	Chinchilla	2	-	-	-	-	-	1/1
<i>Octodon degus</i>	Degu	-	6	9	-	4	-	5/6
Carnivora								
<i>Canis lupus</i>	Grey Wolf	2	-	-	-	2	-	-
<i>Vulpes zerda</i>	Fennec Fox	1	2	-	-	-	-	1/2
<i>Isotryx striatus</i>	Zorilla	2	1	-	-	2	-	1/0
<i>Amblyonyx cinereus</i>	Oriental Small-clawed Otter	5	-	2	1	-	-	2/3/1
<i>Melurus ursinus inornatus</i> (VU)	Sloth Bear	2	-	2	-	1	-	2/1
<i>Ailuropus fulgens fulgens</i> (EN)	Red Panda	2	-	2	2	-	-	1/1
<i>Nasua nasua</i>	Coatiundi	3	-	-	-	-	-	3/0
<i>Potos flavus</i>	Kinkajou	1	-	-	-	-	-	0/1
<i>Suricata suricatta</i>	Meerkat	12	-	-	-	2	1	5/4
<i>Genetta tigrina</i>	Blotched Genet	1	-	-	-	-	1	-
<i>Helogale parvula</i>	Dwarf Mongoose	5	-	1	1	-	-	4/1
<i>Mungos mungo</i>	Banded Mongoose	2	-	-	-	-	-	1/1
<i>Caracal caracal</i>	Caracal Lynx	1	-	-	-	-	-	0/1
<i>Felis margarita harrisoni</i>	Sand Cat	5	-	3	1	1	3	1/2
<i>Panthera leo persica</i> (EN)	Asiatic Lion	5	-	-	-	-	3	1/1
<i>Panthera tigris sumatrae</i> (CR)	Sumatran Tiger	1	1	-	-	-	-	1/1
<i>Panthera pardus saxicolor</i> (EN)	Iranian Leopard	2	-	-	-	1	-	1/0
<i>Neofelis nebulosa nebulosa</i> (VU)	Clouded Leopard	2	-	-	-	1	-	0/1
Proboscidea								
<i>Elephas maximus</i> (EN)	Asian Elephant	3	-	-	-	-	-	0/3
Perissodactyla								
<i>Tapirus indicus</i> (EN)	Malayan Tapir	2	-	-	-	1	-	1/0
<i>Diceros bicornis michaeli</i> (CR)	Black Rhinoceros	2	-	-	-	-	-	1/1
<i>Rhinoceros unicornis</i> (EN)	Greater One-horned Rhinoceros	2	-	-	-	-	2(2)	-
Artiodactyla								
<i>Tayassu tajacu</i>	Collared Peccary	-	6	-	-	-	-	6/0
<i>Hexaprotodon liberiensis</i> (VU)	Pygmy Hippopotamus	2	1	-	-	-	-	1/2
<i>Pudu pudu</i> (VU)	Pudu	2	-	-	-	-	-	0/2
<i>Mosiacus reevesi</i>	Reeves's Muntjac	2	-	-	-	1	-	1/0
<i>Okapia johnstoni</i>	Okapi	2	-	-	-	-	-	2/0
<i>Giraffa camelopardalis*</i>	Giraffe	5	-	-	-	1	2	0/2
<i>Tragelaphus streptoceros*</i>	Greater Kudu	9	-	-	-	2	7(7)	-
<i>Bubalus depressicornis*</i> (EN)	Lowland Anoa	3	-	1	-	-	1	1/2
<i>Oryx leucorox*</i> (EN)	Arabian Oryx	10	-	4	-	5	-	1/8
Domestic								
	Rabbit	7	1	4	-	1	6	2/3
	Guinea Pig	8	4	-	-	1	1	1/9
	Golden Hamster	1	-	-	-	-	-	1/0
	House Mouse (domestic)	10	-	-	-	7	2	1/0
	Brown Rat (domestic)	9	6	-	-	10	-	5/0

		1	2	3	4	5	6	7
	Clawed Bird (domestic gerbil)	3	4	-	-	4	-	3/0
	Ferret	6	-	-	-	-	-	6/0
	Pony: Cream	2	-	-	-	-	-	2/0
	Dartmoor	1	-	-	-	-	-	0/1
	Welsh	-	2	-	-	-	-	1/1
	Shetland	1	-	-	-	-	-	1/0
	Bay	2	-	-	-	-	-	2/0
	Donkey	2	-	-	-	-	2	-
	Llama*	1	1	-	-	-	-	2/0
	Bactrian Camel*	2	1(1)	-	-	-	1(1)	0/2
	Reindeer	2	1	-	-	-	1(1)	0/2
	Pig: Large Black	-	11	16	1	-	-	17
	Tamworth	2	2	14	1	-	-	17
	Camel: Red Poll	3	-	1	-	-	-	0/4
	Sheep: Leicester Longwool	1	2	3	-	2	2	1/1
	Norfolk Horned	2	2	1	-	1	2	0/2
	Goat: Anglo-Nubian	-	2	4	4	-	-	0/2
	Pygmy	4	-	-	-	-	-	0/4
	Bagot	-	2	-	-	-	-	0/2
Total: Mammals		926	93(3)	581	52	512	346(11)	690

BIRDS

Casuariformes

<i>Rhea americana</i>	Greater Rhea	-	4	-	-	-	-	4/0
<i>Dromaius novaehollandiae</i>	Emu	1	-	-	-	-	1(1)	-

Sphenisciformes

<i>Spheniscus demersus</i>	Blackfooted (Jackass) Penguin	41	-	12	5	8	-	8/13/19
----------------------------	-------------------------------	----	---	----	---	---	---	---------

Pelecaniformes

<i>Pelecanus crispus</i> (VU)	Dalmatian Pelican	-	8	-	-	-	-	4/4
<i>Pelecanus onocrotalus</i>	Eastern White Pelican	10	3	-	-	3	-	2/7/1
<i>Phalacrocorax lucidus</i>	White-breasted Cormorant	-	4	-	-	2	-	0/0/2

Ciconiiformes

<i>Nycticorax nycticorax</i>	Night Heron	2	-	-	-	1	-	0/0/1
<i>Ardeola bacchus</i>	Chinese Pond Heron	-	8	-	-	-	-	5/3
<i>Bubulcus ibis</i>	Cattle Egret	9	22	-	-	-	-	0/0/31
<i>Egretta garzetta</i>	Little Egret	9	-	5	1	-	-	3/4/6
<i>Ciconia abdimi</i>	Abdim's Stork	13	-	3	-	3	-	5/5/3
<i>Ciconia episcopus episcopus</i>	Asian Woolly-necked Stork	2	-	-	-	-	-	1/1
<i>Threskiornis aethiopicus</i>	Sacred Ibis	37	-	13	2	6	-	0/0/42
<i>Geronticus eremita</i> (CR)	Waldapp Ibis	8	-	-	-	2	-	2/3/1
<i>Theriacus melanopus</i>	Black-faced Ibis	4	-	-	-	1	-	2/1
<i>Eudocimus ruber</i>	Scarlet Ibis	8	4(4)	-	-	4	-	2/3/3
<i>Plegadis ridgwayi</i>	Pana Ibis	5	-	-	-	4	-	0/1
<i>Phoenicopterus chilensis</i>	Chilean Flamingo	39	-	-	-	2	-	16/21

Anseriformes

<i>Cygnus atratus</i>	Black Swan	-	4	-	-	-	-	0/2/2
<i>Cygnus buccinator</i>	Trumpeter Swan	-	1	-	-	-	-	0/0/1
<i>Anser cygnoides</i> (VU)	Swan Goose	1	-	-	-	-	-	1/0
<i>Anser erythropus</i> (VU)	Lesser White-fronted Goose	2	-	-	-	1	-	1/0
<i>Anser indicus</i>	Bar-headed Goose	4	-	-	-	-	-	3/1

20

		1	2	3	4	5	6	7
<i>Branta sandvicensis</i> (VU)	Nene (Hawaiian Goose)	5	-	-	-	3	-	0/1/1
<i>Cyanochen cyanopterus</i>	Blue-winged Goose	2	-	-	-	-	-	1/1
<i>Tadorna ferruginea</i>	Ruddy Shelduck	7	-	-	-	-	-	2/2/3
<i>Callonetta leucophrys</i>	Ringed Teal	9	-	-	-	1	-	3/5
<i>Anas platyrhynchos</i>	Chloro Wigeon	6	3	-	-	1	-	2/3/3
<i>Anas layardiana</i> (VU)	Laysan Teal	4	-	-	-	2	-	1/1
<i>Anas georgica georgica</i>	South Georgia Pintail	4	4	-	-	4	-	2/2
<i>Anas formosa</i> (VU)	Baikal Teal	3	-	-	-	-	-	2/1
<i>Anas querquedula</i>	Garganey	2	2	2	1	2	-	0/3
<i>Mareca angustirostris</i> (VU)	Marbled Duck	3	4	-	-	1	-	4/2
<i>Aythya nyroca</i> (VU)	Ferruginous (White-eyed) Duck	2	5	-	-	1	-	2/4
<i>Aythya baeri</i> (VU)	Baird's Pochard	2	-	-	-	-	-	1/1
<i>Bucephala albeola</i> S	Bufflehead	-	2	-	-	2	-	-
<i>Mergellus albellus</i>	Smew	4	4	-	-	3	-	3/2
<i>Mergus cucullatus</i>	Hooded Merganser	4	-	-	-	1	-	1/2
<i>Thalassidroma leucorhoa leucorhoa</i>	African White-backed Duck	-	2	-	-	1	-	0/0/1
Falconiformes								
<i>Cathartes aura</i>	Turkey Vulture	6	-	-	-	-	-	4/2
<i>Milvus migrans</i>	Black Kite	2	-	-	-	-	-	1/1
<i>Milvus migrans migrans</i>	Black Kite	1	-	-	-	-	-	1/0
<i>Terathopius ecaudatus</i>	Bateleur Eagle	2	-	-	-	-	-	1/1
<i>Polyboroides typus</i>	African Harrier Hawk	2	3	-	-	-	-	1/4
<i>Parabuteo unicinctus</i>	Harris's Hawk	1	1	-	-	-	-	1/1
<i>Buteo buteo</i>	Buzzard	1	-	-	-	1	-	-
Galliformes								
<i>Rollulus roulroul</i>	Crested Wood Partridge	15	-	24	18	3	9	6/3
<i>Gallus gallus</i>	Red Junglefowl	5	-	-	-	3	-	2/0
<i>Lophura diardi</i> (VU)	Siamese Crested Fireback	4	-	-	-	-	-	2/2
<i>Lophura edwardsi</i> (CR)	Edwards's Pheasant	4	-	4	2	2	-	2/2
<i>Pavo cristatus</i>	Common Peafowl	7	-	4	4	2	-	3/2
<i>Pavo muticus</i> (VU)	Green Peafowl	-	2	-	-	-	-	0/0/2
<i>Afropavo congensis</i> (VU)	Congo Peafowl	1	2	-	-	1	-	2/0
<i>Polyplectron emphanum</i> (EN)	Palawan Peacock Pheasant	4	1	-	-	2	-	2/1
Gruiformes								
<i>Gruus japonensis</i> (VU)	Red-crowned (Manchurian) Crane	2	-	2	2	-	-	1/1
<i>Gruus paradisea</i> (VU)	Stanley Crane	2	-	-	-	-	-	1/1
<i>Limnocorax flavirostris</i>	Black Crane	1	-	-	-	1	-	-
<i>Gallinula nesiotis comeri</i> (VU)	Gough Island Moorhen	4	-	-	-	-	-	2/2
<i>Rallus striatus</i>	Slaty-breasted Rail	1	-	-	-	-	-	1/0
<i>Rallus aquaticus</i>	Water Rail	-	2	-	-	2	-	-
Charadriiformes								
<i>Burhinus oedipodius</i>	Stone Curlew	4	-	3	-	1	2	2/1/1
<i>Recurvirostra amonetta</i>	Pied Avocet	-	4	-	-	1	-	2/1
<i>Paniurus miles miles</i>	Masked Lapwing	5	-	7	3	1	4	2/2
<i>Larus cirrocephalus poiocephalus</i>	Grey-headed Gull	10	-	-	-	-	-	0/0/10
<i>Laruserna inca</i>	Inca Tern	2	-	-	-	-	-	1/1
Columbiformes								
<i>Columba guinea</i>	Speckled Pigeon	5	-	-	-	4	-	0/0/1
<i>Galliolambula cristiger</i> (VU)	Mindanao Bleeding Heart Dove	2	2	-	-	-	-	3/1
<i>Coccyzias cristatus</i> (VU)	Blue Crowned Pigeon	1	-	-	-	1	-	-
<i>Ducula aenea aenea</i>	Green Imperial Pigeon	7	-	4	1	-	6	1/2/1
<i>Ducula aenea pavlina</i>	Chestnut-naped Imperial Pigeon	7	-	3	-	1	6	1/1/1

		1	2	3	4	5	6	7
Coraciiformes								
<i>Dacelo novaeguineae</i>	Kookaburra	3	-	-	-	-	2	0/0/1
<i>Coracias caudata</i>	Lilac-breasted Roller	5	-	3	1	2	1	1/2/1
<i>Anthracooceros albirostris convezus</i>	Southern Pied Hornbill	1	-	-	-	-	-	0/1
<i>Anthracooceros albirostris albirostris</i>	Northern Pied Hornbill	2	-	-	-	-	2	-
<i>Bycanistes subcylindricus</i>	Black-&-white Casqued Hornbill	1	-	-	-	-	-	0/1
<i>Buceros bicornis</i>	Great Indian Hornbill	3	1	-	-	1	-	1/2
<i>Buceros rhinoceros</i>	Rhinoceros Hornbill	1	-	-	-	-	-	0/1
Piciformes								
<i>Ptilopus pyrolophus</i>	Fire-tufted Barbet	2	-	-	-	-	2	-
<i>Lybius dubius</i>	Beaded Barbet	1	-	-	-	1	-	-
<i>Ramphastos tocanus</i>	Red-billed Toucan	-	1	-	-	-	-	0/0/1
<i>Pteroglossus aracari</i>	Black-necked Aracari	5	-	-	-	-	-	4/1
Passeriformes								
<i>Pycnonotus jocosus</i>	Red-whiskered Bulbul	2	-	-	-	-	2	-
<i>Copypicus malabaricus</i>	Common Shama	2	-	-	-	-	-	1/1
<i>Copypicus saularis</i>	Asian Magpie Robin	1	1	2	-	-	-	1/1/2
<i>Cosyphus albicapilla</i>	White-crowned Robin Chat	3	-	6	5	1	-	1/1/1
<i>Cosyphus niveicapilla</i>	Snowy-headed Robin Chat	3	-	-	-	-	-	1/2
<i>Oenanthe oenanthe</i>	Northern Wheatear	-	4	-	-	2	-	0/0/2
<i>Rhipacornis fuliginosus</i>	Plumbeous Redstart	1	-	-	-	-	-	1/0
<i>Garrulax galbanus</i> S	Yellow-throated Laughing Thrush	-	2	-	-	-	-	0/2
<i>Garrulax poecilorhynchus</i>	Rusty Laughing Thrush	2	-	-	-	-	2	-
<i>Garrulax chinensis</i>	Black-throated Laughing Thrush	5	-	4	4	2	-	0/2/1
<i>Paroaria coronata</i>	Red-crested Cardinal	6	-	3	3	3	-	2/1
<i>Paroaria dominicana</i>	Pope Cardinal	-	10	3	-	1	-	5/5/2
<i>Pitta sorbida</i>	Hooded Pitta	-	1	-	-	-	-	0/1
<i>Tachyphonus surinamensis</i> S	Beige-rumped Tanager	-	1	-	-	1	-	-
<i>Tangara cyanoptera</i>	Burnished Buff Tanager	-	1	-	-	-	-	0/0/1
<i>Tangara arthus</i>	Golden Tanager	-	1	-	-	-	-	0/1
<i>Tangara fastuosa</i> (EN)	Superb (Seven-coloured) Tanager	4	-	-	-	-	-	0/0/4
<i>Tangara icterocephala</i>	Silver-throated Tanager	3	-	-	-	2	-	1/0
<i>Chloebia gouldiae</i> (EN)	Gouldian Finch	13	-	18	1	8	10	3/3/6
<i>Erythrura trichopygia</i>	Red-throated Parrot Finch	-	6	-	-	-	-	3/3
<i>Estrilda troglodytes</i>	Black-rumped Wadbill	14	-	-	-	10	-	0/0/4
<i>Vidua sp.</i>	Combassou	1	-	-	-	-	-	1/0
<i>Vidua macroura</i>	Pin-tailed Whydah	2	-	-	-	-	-	2/0
<i>Quelea quelea</i>	Red-beaked Weaver (Quelea)	16	-	-	-	2	-	0/0/14
<i>Foudia flavicans</i> (VU)	Rodriguez Fody	1	-	-	-	-	-	0/1
<i>Lamprolaima iris</i>	Emerald Glossy Starling	5	-	-	-	-	-	1/2/2
<i>Leucophaea rothschildi</i> (CR)	Rothschild's Mynah	14	1	1	-	4	2	3/4/3
<i>Ampelis coronatus</i>	Golden-crested Mynah	1	-	-	-	-	-	1/0
<i>Basilornis celebensis</i>	Sulawesi Mynah	1	2	-	-	1	-	1/1
<i>Pyrhocorax pyrrhocorax</i> (RT)	Red-billed Chough	4	-	2	2	1	-	1/2
<i>Urocissa erythrorhynchos</i>	Red-billed Blue Magpie	1	-	-	-	-	1	-
Domestic								
	Duck	2	4	-	-	2	1	2/1
	Chicken	29	-	17	9	17	2	6/12
	Badgeriger	7	-	9	2	2	4	3/5
Total: Birds		667	187(4)	180	71	168	97(1)	698

REPTILES

		1	2	3	4	5	6	7
Testudines								
<i>Sternotherus odoratus</i>	Stinkpot	4	-	-	-	1	-	0/0/3
<i>Trachemys scripta elegans</i>	Red-eared Terrapin	6	-	-	-	2	-	0/0/4
<i>Trachemys decorata</i> (VU) S	Hispaniolan Slider	-	6	-	-	-	-	0/0/6
<i>Terrapene carolina triunguis</i>	Three-toed Box Terrapin	-	1	-	-	-	1	-
<i>Cuora amboinensis</i>	Malayan Box Turtle	5	-	-	-	-	5	-
<i>Heosemys grandis</i>	Giant Asian Pond Turtle	2	1	-	-	1	-	1/1
<i>Terrapene carolina</i> (EN)	Mexican Box Terrapin	6	-	-	-	5	-	0/0/1
<i>Melanochelys trijuga trijuga</i>	Peninsular Black Turtle	-	2	-	-	-	-	0/2
<i>Pycis arachnoides</i> (VU)	Madagascar Spider Tortoise	8	-	-	-	-	-	0/0/8
<i>Homopus areolatus</i>	Parrot-headed Cape Tortoise	3	-	-	-	-	-	1/2
<i>Testudo graeca</i> (VU)	Spur-thighed Tortoise	31	-	-	-	4	10	0/0/17
<i>Testudo hermanni</i>	Hermann's Tortoise	6	-	-	-	-	-	5/1
<i>Testudo horsfieldi</i> (VU)	Central Asian Tortoise	5	-	-	-	-	-	4/1
<i>Testudo kleinmanni</i> (EN)	Egyptian Tortoise	14	-	1	-	2	-	7/5/1
<i>Testudo marginata</i>	Margined Tortoise	4	-	-	-	-	-	4/0
<i>Malacochersus tornieri</i> (VU)	Pancake Tortoise	2	-	2	-	-	-	1/1/2
<i>Geochelone pardalis</i>	Leopard Tortoise	1	-	-	-	-	-	0/1
<i>Chelus fimbriata</i>	Matanata	1	-	-	-	-	-	0/0/1
<i>Chelodina longicollis</i>	Long-necked Terrapin	4	-	-	-	-	-	2/2
<i>Chelodina siebenrocki</i>	Siebenrock's Snake-necked Turtle	2	-	-	-	2	-	-
<i>Emydura australis albertusii</i>	New Guinea Red-bellied Terrapin	3	-	-	-	-	-	0/0/3
<i>Pelodiscus sinensis</i>	Chinese Soft-shelled Terrapin	1	-	-	-	-	-	0/0/1
Crocodylia								
<i>Alligator sinensis</i> (CR)	Chinese Alligator	4	-	-	-	-	-	2/2
Sauria								
<i>Tarentola minihayae</i> S	Egyptian Gecko	-	4	-	-	-	-	2/2
<i>Nactus serpensinula serpensinula</i> (VU)	Serpent Island Gecko	2	-	-	-	-	-	1/0/1
<i>Nactus serpensinula darrelli</i> (VU)	Round Island Gecko	1	-	-	-	1	-	-
<i>Stenodactylus stenocephalus</i>	Elegant Gecko	4	-	1	-	2	-	0/2/1
<i>Paroedura pictus</i>	Malagasy Night Gecko	1	-	-	-	-	-	1/0
<i>Gekko gekko</i>	Tokay Gecko	2	-	-	-	1	-	1/0
<i>Homopholis wahlbergi</i>	Wahlberg's Velvet Gecko	1	-	-	-	-	-	1/0
<i>Phelsuma cepedianana</i>	Mauritius Day Gecko	3	-	-	-	3	-	-
<i>Phelsuma ornata ornata</i>	Ornate Day Gecko	5	-	-	-	4	-	0/0/1
<i>Phelsuma gaimbeauxi rosagularis</i>	Maccabé Day Gecko	2	-	-	-	1	-	1/0
<i>Phelsuma standingi</i> (VU)	Standing's Day Gecko	5	-	-	-	1	-	2/2
<i>Eublepharis macularius</i>	Leopard Ground Gecko	3	-	-	-	-	-	1/2
<i>Anolis carolinensis</i>	Green Anole	6	-	-	-	6	-	-
<i>Basiliscus plimifrons</i>	Plumed Basilisk	2	-	-	-	-	2	-
<i>Iguana iguana</i>	Common Iguana	4	-	-	-	-	4	-
<i>Cyclura cornuta cornuta</i> (VU)	Rhinoceros Iguana	8	-	-	-	-	2	3/1/2
<i>Opharus curvieri</i>	Madagascar Spiny Lizard	3	-	-	-	2	-	1/0
<i>Pogona vitticeps</i>	Inland Bearded Dragon	6	-	-	-	2	-	1/1/2
<i>Hydrocaurus pustulatus</i>	Philippine Sail-fin Water Dragon	1	-	-	-	-	1	-
<i>Uromastyx hardwicki</i>	Indian Spiny-tailed Lizard	2	-	-	-	1	-	0/1
<i>Chamaeleo calyptratus</i>	Yemen Chameleon	3	1(1)	-	-	1	-	2/1
<i>Chamaeleo pardalis</i>	Parther Chameleon	1	-	-	-	1	-	-
<i>Crotaphytus wislizeni</i>	Prehensile-tailed Skink	6	-	-	-	-	-	2/2/2
<i>Tiliqua rugosa</i>	Shingleback	8	-	-	-	-	-	3/4/1
<i>Tiliqua scincoides scincoides</i>	Eastern Blue-tongued Skink	3	-	-	-	-	-	1/2
<i>Mabuya perroteti</i>	Red-sided Skink	1	-	-	-	-	-	0/0/1
Total: Reptiles		469	54(1)	122	5	132	49	459

		1	2	3	4	5	6	7
<i>Gongylomorphus bojeri</i>	Bojer's Skink	3	-	-	-	2	-	0/0/1
<i>Gerrhonotus major</i>	Greater Plated Lizard	3	-	1	-	-	-	2/1/1
<i>Lacerta lepida</i> (RT)	Ocellated Lizard (Iberlinga Isl.)	4	-	-	-	-	-	2/2
<i>Lacerta lepida lepida</i>	Jewelled Lizard	2	-	-	-	1	-	0/1
<i>Varanus prasinus</i>	Green Tree Monitor	-	8	-	-	3	-	0/0/5
<i>Varanus timorensis</i>	Timor Monitor	-	7	-	-	4	-	0/0/3
<i>Varanus albigularis</i>	Bosc's Monitor	3	-	-	-	1	-	0/0/2
<i>Varanus niloticus</i>	Nile Monitor	1	-	-	-	-	-	1/0
<i>Heloderma suspectum suspectum</i> (VU)	Reticulated Gila Monster	4	-	-	-	-	-	2/2
<i>Heloderma horridum exasperatum</i> (VU)	Rio Grijalva Beaded Lizard	1	-	-	-	-	-	1/0
<i>Ophisaurus apodus</i>	Scheltopsnik (Glass Lizard)	4	-	-	-	-	-	0/0/4
<i>Cordylus giganteus</i> (VU)	Sungazer	7	-	-	-	1	-	3/3
<i>Cordylus polyzonus</i>	Karoo Girdled Lizard	6	-	-	-	3	-	3/0
Serpentes								
<i>Liasis albertusii</i>	D'Albert's Python	2	4	-	-	1	1	1/3
<i>Liasis mackloti</i> S	Dun's Python	-	4	-	-	4	-	-
<i>Liasis mackloti sarawensis</i> SS	Savu Python	-	8	-	-	2	-	0/0/6
<i>Morelia spilotes spilotes</i>	Diamond Python	-	1	-	-	-	-	1/0
<i>Python amethystinus</i>	Amethyst Python	1	-	-	-	-	-	-
<i>Python curtus brongersmai</i>	Blood Python	4	-	-	-	-	-	2/2
<i>Python curtus breitensteini</i> SS	Borneo Blood Python	-	5	-	-	-	-	0/0/5
<i>Python molurus bivittatus</i>	Burmese Python	3	-	6	-	3	2	0/1/3
<i>Python regius</i>	Royal Python	10	-	6	-	2	4	2/1/7
<i>Epicrates subflavus</i> (VU)	Jamaican Boa	4	-	-	-	1	-	3/0
<i>Sanzinia madagascariensis</i> (VU)	Madagascan Tree Boa	8	-	-	-	-	-	2/2/2
<i>Boa constrictor</i>	Boa Constrictor	2	-	-	-	-	-	0/0/2
<i>Boa constrictor occidentalis</i>	Argentine Boa	3	-	-	-	1	-	0/2
<i>Acrantophis dumerilii</i>	Dumeril's Boa	2	-	10	2	-	-	1/1/8
<i>Eryx conicus</i>	Rough-scaled Sand Boa	2	-	-	-	-	-	0/2
<i>Eryx johnii</i>	Smooth Sand Boa	2	-	-	-	-	-	2/0
<i>Natrix natrix</i>	Grass Snake	2	-	-	-	2	-	-
<i>Hydrodynastes gigas</i>	Boipevaçu Snake	5	-	2	-	1	2	2/1/1
<i>Heterodon nasicus</i>	Western Hog Nose Snake	2	-	-	-	-	-	1/0/1
<i>Coronella austriaca</i> (RT)	Smooth Snake	7	-	-	-	1	-	1/1/4
<i>Lampropeltis getulus floridana</i>	Florida King Snake	1	-	-	-	-	-	0/1
<i>Lampropeltis getulus californica</i>	Californian King Snake	1	-	-	-	-	-	0/0/1
<i>Lampropeltis triangulum sinaloae</i>	Sinaloa Milk Snake	2	-	-	-	1	-	0/1
<i>Boiga irregularis</i>	Brown Cat Snake	1	-	-	-	-	-	1/0
<i>Dispholidus typus</i>	Boornalang	4	-	-	-	-	-	2/2
<i>Pseudochis collettii</i>	Collett's Snake	2	-	-	-	-	-	0/2
<i>Oxyrhamphus scutellatus</i>	Taipan	2	-	-	-	-	-	2/0
<i>Acanthophis antarcticus</i>	Death Adder	4	-	-	-	-	-	2/2
<i>Bungarus candidus</i>	Malayan Krait	2	-	-	-	-	-	0/0/2
<i>Naja siamensis</i>	Siamese Cobra	9	-	9	-	2	-	0/0/16
<i>Naja annalifera</i>	Scouted Cobra	2	-	-	-	-	-	0/0/2
<i>Naja moasambica</i>	Mozambique Spitting Cobra	2	-	-	-	-	-	0/0/2
<i>Naja pallida</i>	Spitting Cobra	7	-	-	-	-	-	2/1/1
<i>Naja sp.</i>	Brown Spitting Cobra	4	-	-	-	-	-	0/0/4
<i>Naja kaouthia</i>	Monocellate Cobra	2	-	-	-	-	-	

		1	2	3	4	5	6	7
<i>Bombina orientalis</i>	Fire-bellied Toad	-	8	-	-	-	-	0/08
<i>Typhlonectes natans</i>	Aquatic Caecilian	-	4	-	-	-	-	0/04
<i>Ambystoma tigrinum</i>	Tiger Salamander	-	3	-	-	2	-	0/01
Total: Amphibians		172	51(6)	10	1	88	-	144

FISHES

OSTEICHTHYES

Acipenseriformes

<i>Acipenser ruthenus</i> (VU)	Sterlet	8	-	-	-	-	3	5
<i>Scaphirhynchus platorhynchus</i> (VU)	Shovelnose Sturgeon	2	-	-	-	-	-	2
<i>Polyodon spatula</i> (VU)	Paddlefish	14	-	-	-	-	6	8

Amiiformes

<i>Amia calva</i>	Bowfin	2	-	-	-	-	-	2
-------------------	--------	---	---	---	---	---	---	---

Anguilliformes

<i>Anguilla anguilla</i>	Common Eel	1	-	-	-	-	-	1
<i>Conger conger</i>	Conger Eel	4	-	-	-	1	-	3
<i>Echidna zebra</i>	Zebra Moray Eel	5	-	-	-	-	-	5
<i>Gymnothorax fuvagineus</i>	Leopard Moray Eel	2	-	-	-	-	-	2

Atheriniformes

<i>Bedotia geayi</i>	Madagascar Rainbowfish	1	12	-	-	6	-	7
<i>Glossogobius aureus</i> (VU)	Metallic Rainbowfish	19	-	-	-	6	-	13
<i>Melanotaenia maccullochi</i>	McCulloch's Rainbowfish	1	-	-	-	-	-	1
<i>Melanotaenia boesemani</i> (EN)	Boesemani's Rainbowfish	4	-	-	-	2	-	2
<i>Melanotaenia trifasciata</i>	Rainbowfish	1	-	-	-	1	-	-

Belontiiformes

<i>Dermogenys paucispinis</i>	Malayan Halfbeak	4	-	-	-	3	-	1
<i>Nomorhamphus ebrardi</i>	Sulawesi Halfbeak	46	-	15	-	34	-	27

Beryciformes

<i>Myripristis jacobus</i>	Blackbar Soldierfish	3	-	-	-	1	-	2
<i>Myripristis sp.</i>	Squidhead Soldierfish	-	5	-	-	-	-	5
<i>Sargocentron sp.</i>	Striped Soldierfish	-	4	-	-	-	-	4

Characiformes

<i>Aceatorhynchus falcatus</i>	Spotted Cachoro	1	-	-	-	1	-	-
<i>Astyanax mexicanus</i> (VU)	Blind Cavefish	22	-	-	-	-	-	22
<i>Hemigrammus bleheri</i>	Rummy-nose Tetra	4	-	-	-	3	-	1
<i>Hemigrammus erythrozonus</i>	Glowlight Tetra	-	20	-	-	12	-	8
<i>Hyphessobrycon herbertaxelrodi</i>	Black Neon Tetra	20	-	-	-	11	-	9
<i>Hyphessobrycon pulchripinnis</i>	Lemon Tetra	13	-	-	-	7	-	6
<i>Hyphessobrycon serpa</i>	Serpae Tetra	6	-	-	-	3	-	3
<i>Parachanna innesi</i>	Neon Tetra	-	8	-	-	5	-	3
<i>Pristella maxillaris</i>	X-ray Tetra	-	20	-	-	7	-	13
<i>Gymnocorymbus ternetzi</i>	Black Widow Tetra	-	28	-	-	4	-	24
<i>Metynnis argenteus</i>	Silver Dollar	3	-	-	-	1	-	2
<i>Serrasalminus nattereri</i>	Red-bellied Piranha	-138	-	-	-	-	-	-138
<i>Triplophysa angulatus</i>	Narrow Hatchetfish	6	-	-	-	-	-	6
<i>Hasemania nana</i>	Silver-tipped Tetra	10	20	-	-	12	-	18

Cypriniformes

<i>Myxocyprinus asiaticus</i>	Chinese Sailfin Sucker	1	8	-	-	-	-	9
<i>Botia hymenophysa</i>	Tiger Botia	2	-	-	-	-	-	2
<i>Botia lohachata</i>	Pakistani Loach	4	-	-	-	4	-	-
<i>Botia macracantha</i>	Clown Loach	5	-	-	-	1	-	4
<i>Botia modesta</i>	Red-lined Botia	3	-	-	-	1	-	2
<i>Botia sidhimunki</i> (CR)	Chain Loach	10	-	-	-	2	-	8
<i>Leptobotia manschurica</i>	Manchurian Loach	2	-	-	-	1	-	1
<i>Achellognathus micropterus</i>	Asian Bitterling	9	-	-	-	5	-	4
<i>Barbus barbatus</i>	Barbel	4	-	-	-	1	-	3
<i>Barbus bimaculatus</i>	Two-spot Barb	12	-	-	-	-	-	12
<i>Capoeta arulius</i>	Arulius Barb	12	-	-	-	3	-	9
<i>Capoeta oligolepis</i>	Checker Barb	14	-	-	-	7	-	7
<i>Capoeta semifasciatus</i>	Chinese Green Barb	5	-	-	-	-	-	5
<i>Capoeta tetrazona</i>	Tiger Barb	-	8	-	-	5	-	3
<i>Capoeta titteya</i>	Cherry Barb	6	-	-	-	4	-	2
<i>Carassius auratus</i>	Goldfish	16	-	-	-	4	-	12
<i>Ctenopharyngodon idella</i>	Grass Carp	7	-	-	-	2	-	5
<i>Cyprinus carpio</i>	Carp - Koi, mirror, etc.	-53	1	-	-	5	-	-49
<i>Epalzeorhynchus stamensis</i>	Flying Fox	2	-	-	-	1	-	1
<i>Garra sp.</i>	Chinese Loach	3	-	-	-	-	-	3
<i>Gobio gobio</i>	Gudgeon	6	6	-	-	10	-	2
<i>Hypophthalmichthys molitrix</i>	Silver Carp	6	-	-	-	3	-	3
<i>Lentiscus cephalus</i>	Chub	8	-	-	-	-	-	8
<i>Lentiscus idus</i>	Ide or Orfe	16	-	-	-	6	-	10
<i>Osteochilus vittatus</i>	Bony-lipped Barb	1	-	-	-	1	-	-
<i>Phoxinus phoxinus</i>	Minnnow	-	4	-	-	-	-	4
<i>Pseudorasbora parva</i>	Clicking Barb	10	-	-	-	-	-	10
<i>Puntius bimaculatus</i>	Red-stripe Barb	14	-	-	-	14	-	-
<i>Puntius nigrofasciatus</i>	Black Ruby Barb	2	-	-	-	2	-	-
<i>Puntius sachsii</i>	Golden Barb	1	-	-	-	1	-	-
<i>Rasbora borapetensis</i>	Red-tailed Rasbora	10	-	-	-	-	-	10
<i>Rasbora elegans</i>	Elegant Rasbora	17	-	-	-	5	-	12
<i>Rasbora trilineata</i>	Scissortail Rasbora	1	-	-	-	1	-	-
<i>Rasbora heteromorpha</i>	Harlequin Rasbora	-	20	-	-	2	-	18
<i>Rutilus rutilus</i>	Roach	8	-	-	-	2	-	6
<i>Sarcocheilichthys sinensis</i>	Amur Sucker	9	-	-	-	-	-	9
<i>Scardinius erythrophthalmus</i>	Rudd	21	-	-69	-	-	-	40 -50
<i>Tinca tinca</i>	Tench	25	-	>13	-	2	10	>26
<i>Zacco sp.</i>	Zacco	1	-	-	-	-	-	1
<i>Notropis latrensis</i>	Red Shiner	7	-	-	-	1	-	6

Cyprinodontiformes

<i>Ameletus splendens</i> (EW)	Butterfly Goodeid	170	-	nr	-	>10	-	-160
<i>Pachypanchax omalonotus</i>	Madagascar Killifish	11	-	11	-	-	-	22
<i>Xenotoca eizani</i>	Red-tailed Goodeid	23	-	-	-	23	-	-
<i>Poecilia nigrofasciata</i>	Black-barred Limia	217	-	-45	-	-41	61	-160
<i>Poecilia reticulata</i>	Guppy	1 col.	-	-	-	-	-	1 colony
<i>Poecilia reticulata</i> (wild form)	Pitch-lake Guppy	-500	-	-192	-	3	69	-620

Gadiformes

<i>Pollachius pollachius</i>	Pollack	1	-	-	-	1	-	-
<i>Trisopterus luscus</i>	Bib	-	15	-	-	-	-	15

Gasterosteiformes

<i>Gasterosteus aculeatus</i>	Three-spined Stickleback	24	-	-54	-	3	-	-75
-------------------------------	--------------------------	----	---	-----	---	---	---	-----

		1	2	3	4	5	6	7
<i>Eurypagrus draconis</i>	Seamoth	-	3	-	-	3	-	-
<i>Nerophis opidion</i>	Worm Pipefish	12	-	-	-	5	-	7
<i>Syngnathus acus</i>	Greater Pipefish	16	-	-100	-	-105	-	11
<i>Hippocampus sp.</i>	Seahorse	4	2	-	-	2	-	4
<i>Hippocampus capensis</i>	Krynska Seahorse	-	6	36	-	6	-	2/2/32
<i>Entelurus aequoreus</i>	Snake Pipefish	-	2	-	-	1	-	1

Gymnotiformes

<i>Electrophorus electricus</i>	Electric Eel	1	-	-	-	-	-	1
---------------------------------	--------------	---	---	---	---	---	---	---

Lepisosteiformes

<i>Lepisosteus oculatus</i>	Spotted Gar	2	-	-	-	-	-	2
<i>Lepisosteus platyrhincus</i>	Florida Gar	2	-	-	-	-	-	2
<i>Lepisosteus platostomus</i>	Shortnose Gar	1	-	-	-	-	-	1

Osteoglossiformes

<i>Gnathionemus ibis</i>	Elephant-nose Fish	1	-	-	-	1	-	-
<i>Notopterus chitala</i>	Clown Knife Fish	3	-	-	-	-	-	3

Perciformes

<i>Naso lituratus</i>	Lipstick Tang	1	-	-	-	-	-	1
<i>Paracanthurus hepatus</i>	Regal Tang	3	1	-	-	1	-	3
<i>Zebrasoma flavescens</i>	Yellow Sailfin Tang	5	-	-	-	4	-	1
<i>Ctenopoma kingsleyae</i>	Kingsley's Climbing Perch	3	-	-	-	-	-	3
<i>Apogon nematopterus</i>	Pyjama Cardinal	3	-	-	-	-	-	3
<i>Pteropogon kauderni</i>	Indonesian/Banggai Cardinal Fish	-	22	-	-	1	-	21
<i>Belontiella signata</i>	Combtail	14	-	-	-	1	-	13
<i>Betta splendens</i>	Siam Fighting Fish	2	5	-	-	6	-	1
<i>Colisa channa</i>	Honey Gourami	1	3	-	-	4	-	-
<i>Colisa lalia</i>	Dwarf Gourami	4	3	-	-	7	-	-
<i>Macropodus opercularis</i>	Paradise Fish	6	-	-	-	6	-	-
<i>Trichogaster trichogaster</i>	Three-spot Gourami	8	-	-	-	3	-	5
<i>Bleinnius gattorugine</i>	Tompot Blenny	4	-	-	-	1	-	3
<i>Lipophrys pholis</i>	Shanny	14	10	-	-	4	-	20
<i>Pteropichthys splendens</i>	Mandarin Fish	1	-	-	-	-	-	1
<i>Lepomis gibbosus</i>	Pumpkinseed	6	1	-	-	-	-	7
<i>Lepomis gulosus</i>	Warmouth Bass	3	-	-	-	2	-	1
<i>Lepomis humilis</i>	Orange-spotted Sunfish	2	-	-	-	2	-	-
<i>Lepomis megalotis</i>	Long-eared Sunfish	8	-	-	-	5	-	3
<i>Siniperca chuatsi</i>	Chinese Perch	3	-	-	-	-	-	3
<i>Chaetodon falcula</i>	Falcula Butterflyfish	1	-	-	-	-	-	1
<i>Chelmon rostratus</i>	Copperband Butterflyfish	1	-	-	-	-	-	1
<i>Hemiochilus acuminatus</i>	Wimpole or Bannerfish	4	-	-	-	-	-	4
<i>Apistogramma cacatuoides</i>	Cockatoo Dwarf Cichlid	1	-	-	-	1	-	-
<i>Chromidotilapia guentheri</i>	Guenther's Mouthbrooder	11	-	-	-	5	-	6
<i>Cyphotilapia frontosa</i>	Blue-banded Cichlid	6	-	-	-	2	-	4
<i>Labrochromis ishmaeli</i> (EW)	Lake Victoria Cichlid	8	-	-	-	5	3	-
<i>Jaliscochromis regani</i>	Striped Julie	31	-	-	-	8	-	23
<i>Labotropheus fuelleborni</i>	Red-top Cichlid	113	-	-	-	2	-	111
<i>Ptychochromis sp.</i>	Madagascar Cichlid	-	12	-	-	1	-	11
<i>Neochromis greenwoodi</i>	Velvet Black Lake Victoria Cichlid	-	104	94	-	57	20	121
<i>Melanochromis johanni</i>	Johanni Cichlid	-	6	-	-	3	-	3
<i>Melanochromis chipokee</i>	Mbuna Cichlid	-	5	-	-	1	-	4
<i>Haplochromis venustus</i>	Lake Malawi Cichlid	-	8	-	-	-	-	8
<i>Neolamprologus breichardi</i>	Lyretail Lamprologus	284	-	-	-	-154	-	-130
<i>Neolamprologus leleupi</i>	Golden Lamprologus	13	-	-	-	6	-	7
<i>Pseudocrenilabrus multicolor</i>	Egyptian Mouthbrooder	6	-	4	-	4	-	6
<i>Pseudotropheus zebra</i>	Zebra Mbuna	28	-	-				

	1	2	3	4	5	6	7
Polypteriformes							
<i>Polypterus bicir</i>	2	-	-	-	-	-	2
<i>Polypterus delhezi</i>	1	-	-	-	1	-	-
<i>Polypterus palmas</i>	1	-	-	-	-	-	1
<i>Polypterus retrospinosus</i>	2	-	-	-	-	-	2
<i>Polypterus senegalus</i>	1	-	-	-	-	-	1
<i>Polypterus weeki</i>	1	-	-	-	-	-	1

	1	2	3	4	5	6	7
Salmoniformes							
<i>Esox lucius</i>	1	-	-	-	-	-	1
<i>Oncorhynchus mykiss</i>	9	13	-	-	1	9	12
<i>Salmo trutta</i>	4	-	-	-	-	4	-

	1	2	3	4	5	6	7
Scorpaeniformes							
<i>Trigla lucerna</i>	9	5	-	-	8	-	6
<i>Hypodes rubripinnis</i>	4	-	-	-	3	-	1
<i>Cottus gobio</i>	5	-	-	-	5	-	-
<i>Taurulus bubalis</i>	12	-	-	-	12	-	-
<i>Pterois volitans</i>	1	3	-	-	1	-	3

	1	2	3	4	5	6	7
Siluriformes							
<i>Pelteobagrus brachiuskowi</i>	11	-	-	-	6	-	5
<i>Corydoras aeneus</i>	11	-	-	-	4	-	7
<i>Corydoras elegans</i>	5	-	-	-	-	-	5
<i>Corydoras haraladtschulzi</i>	4	-	-	-	-	-	4
<i>Corydoras melanostictus</i>	2	-	-	-	2	-	-
<i>Corydoras nattereri</i>	3	-	-	-	-	-	3
<i>Corydoras paleatus</i>	19	-	-	-	2	-	17
<i>Corydoras panda</i>	1	-	-	-	1	-	-
<i>Corydoras trilineatus</i>	1	-	-	-	-	-	1
<i>Corydoras undulatus</i>	10	-	-	-	2	-	8
<i>Hoplosternum littorale</i>	1	-	-	-	1	-	-
<i>Agamyxis pectinifrons</i>	1	-	-	-	-	-	1
<i>Platydoras costatus</i>	1	-	-	-	-	-	1
<i>Heteropneustes fossilis</i>	2	-	-	-	-	-	2
<i>Ameiurus melas</i>	1	-	-	-	1	-	-
<i>Ameiurus nebulosus</i>	1	-	-	-	-	-	1
<i>Ancistrus sp.</i>	1	-	-	-	-	-	1
<i>Otocinclus affinis</i>	8	-	-	-	3	-	5
<i>Pterygoplichthys gibbiceps</i>	8	-	-	-	1	1	6
<i>Synodontis angelicus</i>	1	-	-	-	-	-	1
<i>Synodontis clarias</i>	1	-	-	-	-	-	1
<i>Synodontis multipunctatus</i>	3	-	-	-	2	-	1
<i>Synodontis sp.</i>	4	-	-	-	1	-	3

	1	2	3	4	5	6	7
Tetraodontiformes							
<i>Rhinocentrus asotai</i>	1	-	-	-	-	-	1
<i>Arothron sp.</i>	-	1	-	-	-	-	1
<i>Arothron hispidus</i>	1	-	-	-	1	-	-
<i>Arothron diadema</i>	-	1	-	-	-	-	1
<i>Arothron stellatus</i>	1	-	-	-	-	-	1
<i>Arothron nigropunctatus</i>	-	2	-	-	-	-	2
<i>Arothron nappa</i>	1	-	-	-	-	-	1

	1	2	3	4	5	6	7
CHONDRICHTHYES							
Carcharhiniformes							
<i>Carcharhinus melanopterus</i>	2	-	-	-	-	-	2

	1	2	3	4	5	6	7
Lamniformes							
<i>Squalorhynchus canicula</i>	7	5	-	-	4	-	8
<i>Squalorhynchus stellaris</i>	1	-	-	-	1	-	-
Rajiformes							
<i>Potamotrygon sp.</i>	7	-	-	-	1	4	2
<i>Raja clavata</i>	1	2	-	-	-	-	3
<i>Raja unoblata</i>	1	-	-	-	-	-	1
<i>Raja montagui</i>	-	1	-	-	1	-	-
<i>Raja macroocellata</i>	-	2	-	-	-	-	2
Total: Fishes plus 1 colony	2739	511	633	-	846	246	2791

INVERTEBRATES

Key to columns for Invertebrates:

column 1	Arrivals
column 2	Births/Hatchings
column 3	Deaths
column 4	Departures
column 5	Number at end of year of Young/Eggs (na=not applicable, nr=not recorded)
column 6	Number at end of year of Adult Males/Adult Females/Adults of unknown gender or without gender, or number of colonies
column 7	Count Unit: 1=Adult numbers represent exact number of individuals. Young and Eggs may be estimated. A=All numbers are approximate. C=Numbers represent exact number of colonies
column 8	Population Status: M=Maintaining B=Breeding D=Declining N=Newly acquired species. nr=Not recorded. na=Not applicable.

Invertebrates held in the Invertebrate Conservation Centre

	1	2	3	4	5	6	7/8
--	---	---	---	---	---	---	-----

Cnidaria							
Scyphozoa							
<i>Cassiopeia sp.</i>	41	nr	nr	-	nr/nr	0/0/42	1/M

ANNELIDA

Hirudinea

<i>Hirudo medicinalis</i> (RT)	1	12	17	-	2/0	0/0/0	1/M
<i>Hirudinaria manillensis</i>	13	-	13	-	0/0	0/0/0	1/na

MOLLUSCA

Gastropoda

(figures reported for *Partula* and *Samoana* spp. are for the end of the year only)

<i>Partula affinis</i> (CR)	-	-	-	-	0/na	0/0/5	1/M
<i>Partula clara</i> (CR)	-	-	-	-	314/na	0/0/248	1/B
<i>Partula dentifera</i> (EW)	-	-	-	-	149/na	0/0/142	1/M
<i>Partula faba</i> (EW)	-	-	-	-	115/na	0/0/62	1/B
<i>Partula gibba</i> (CR)	-	-	-	-	12/na	0/0/4	1/B
<i>Partula hebe bella</i> (EW)	-	-	-	-	10/na	0/0/11	1/M
<i>Partula hyalina</i> (CR)	-	-	-	-	1/na	0/0/8	1/M
<i>Partula labrusca</i> (EW)	-	-	-	-	28/na	0/0/23	1/B
<i>Partula marabilla x taeniata</i>	-	-	-	-	0/na	0/0/6	1/M
<i>Partula mooreana</i> (EW)	-	-	-	-	15/na	0/0/42	1/M
<i>Partula nodosa</i> (EW)	-	-	-	-	2/na	0/0/5	1/M
<i>Partula otahetiana</i> (EW)	-	-	-	-	6/na	0/0/12	1/D

	1	2	3	4	5	6	7/8
<i>Partula radiolata</i> (CR)	-	-	-	-	11/na	0/0/11	1/B
<i>Partula rosea</i> (CR)	-	-	-	-	0/na	0/0/0	1/na
<i>Partula sutoralis strigosa</i> (EW)	-	-	-	-	144/na	0/0/129	1/B
<i>Partula sutoralis venillam</i> (EW)	-	-	-	-	158/na	0/0/126	1/M
<i>Partula sutoralis mixed sp.</i>	-	-	-	-	1/na	0/0/4	1/D
<i>Partula taeniata nucleola</i>	-	-	-	-	7/na	0/0/0	1/M
<i>Partula tohiveana</i> (EW)	-	-	-	-	99/na	0/0/66	1/D
<i>Partula trita</i> (EW)	-	-	-	-	23/na	0/0/24	1/B
<i>Partula tomeri</i>	-	-	-	-	10/na	0/0/2	1/M
<i>Partula varia</i> (CR)	-	-	-	-	128/na	0/0/77	1/B
<i>Samoana attenuata</i> (EN)	-	-	-	-	0/na	0/0/5	1/M
<i>Samoana bellula</i>	-	-	-	-	8/na	0/0/4	1/M
<i>Samoana sp. (Hiva Oa 1)</i>	-	-	-	-	8/na	0/0/4	1/M
<i>Trochomorpha sp.</i>	-	-	-	-	3/na	0/0/0	1/M
<i>Tahitian Trochomorpha</i>	-	-	-	-	200	0/0/4	A/B
<i>Tahitian Tree Snail</i>	4	nr	nr	-	0/0	0/0/0	1/na
<i>Lardenia normalis</i>	5	nr	5	-	0/0	0/0/0	1/na
<i>Achatina achatina</i>	105	nr	nr	-	nr/nr	0/0/95	A/B
<i>Achatina fulica</i>	11	nr	nr	-	9/0	0/0/2	1/M
<i>Archachatina marginata</i>	-	-	1	-	0/0	0/0/0	1/na
<i>Asperitus sp.</i>	39	nr	nr	9	30/0	0/0/1	1/B
<i>Euglandina rosea</i>	-	-	-	-	2/0	0/0/1	1/M
<i>Sprophocetus oblongus</i>	-	nr	nr	-	7/0	0/0/9	1/B
<i>Diplommatina delatouri</i>	-	-	-	-	107/0	0/0/4	1/B
<i>Pachnodus fregatensis</i>	-	-	140	-	30	-	-
<i>Pomacea pallidosa</i>	-	nr	nr	-	0/0	0/0/110	1/B

CRUSTACEA

Malacostraca

<i>Birgus latro</i>	4	-	-	-	0/0	2/2/0	1/N
<i>Coenobita clypeatus</i>	-	-	-	-	0/0	0/0/1	1/M
<i>Cardisoma sp.</i>	-	-	2	-	0/0	0/0/3	1/D

ARACHNIDA

Araneae

<i>Nephila madagascariensis</i>	-	-	7	-	0/0r	0/0/0	1/na
<i>Nephila senegalensis</i>	40	-	20	-	18/nr	1/1/0	1/N
<i>Brachypelma auratum</i>	-	-	-	-	0/0	0/1/0	1/M
<i>Brachypelma pallidum</i>	-	-	1	-	2/0	0/0/0	1/M
<i>Brachypelma emilia</i>	1	-	9	21	51/0	0/7/0	1/M
<i>Brachypelma emilia</i>	-	-	-	1	0/0	0/0/0	1/na
<i>Brachypelma vagans</i>	-	-	-	-	1/0	0/1/0	1/M
<i>Lasiadora paralybana</i>	-	-	-	-	0/0	0/0/2	1/M
<i>Avicularia avicularia</i>	-	-	1	-	2/0	0/1/0	1/M
<i>Metopium sp.</i>	-	-	-	-	0/0	0/0/1	1/M
<i>Poecilotheria regalis</i>	1	-	-	-	0/0	0/2/0	1/M
<i>Poecilotheria subfucata</i>	17	-	3	13	0/0	1/1/0	1/M
<i>Poecilotheria formosa</i>	2	-	-	-	0/0	1/1/0	1/M
<i>Latrodectus mactans</i>	4	nr	nr	-	1/0	1/6/0	1/M
<i>Latrodectus variolus</i>	2	-	1	-	0/0	0/0/1	1/N
<i>Heteropoda sp.</i>	4	-	1	-	0/0	1/2/0	1/M
<i>Phidippus audax</i>	3	-	2	-	0/0	1/0/0	1/N

Scorpiones

<i>Androctonus australis</i>	4	-	6	-	2/0	0/0/0	1/D
<i>Androctonus craxichauda</i>	-	-	1	-	0/0	0/0/3	1/M
<i>Buthus occitanus</i>	1	-	1	-	0/0	0/1/0	1/M
<i>Buthus sp.</i>	1	-	-	-	0/0	0/0/1	1/M
<i>Pandinus imperator</i>	-	nr	nr	-	57/0	0/0/13	1/M
<i>Pandinus sp.</i>	-	-	-	-	0/0	0/0/1	1/M

<i>Heterometrus sp.</i>	11	-	1	-	7/0	0/0/3	1/N
<i>Euscorymbus flavicaudus</i>	15	-	13	-	0/0	0/0/2	1/D

Solifugae

<i>Galeodes sp.</i>	2	-	1	-	0/0	0/0/2	1/M
---------------------	---	---	---	---	-----	-------	-----

MYRIAPODA

Chilopoda

<i>Scolopendra gigantea</i>	1	-	-	-	0/0	0/0/1	1/M
<i>Scolopendra sp.</i>	-	-	1	-	0/0	0/0/0	1/na

		1	2	3	4	5	6	7/8
<i>Blaps mucronata</i>	Churchyard Beetle	-	nr	nr	-	0/0	0/0/16	1/na
<i>Blaps sp.</i>	Desert Beetle	9	nr	7	-	0/0	0/0/3	1/0
Unidentified species	Minotaur Beetle	6	-	-	-	0/0	0/0/6	1/N
Unidentified species	Tenebrionid Beetle	14	-	1	-	0/0	0/0/13	1/N
Unidentified species	Large Tenebrionid Beetle	6	-	1	-	0/0	0/0/5	1/N
Diptera								
<i>Drosophila melanogaster</i>	Fruit Fly	-	-	-	-	0/0	0/0/1	C/M
Lepidoptera								
<i>Bombyx mori</i>	Silkworm	-	nr	nr	-	0/300	0/0/0	A/M
<i>Heliconius charitonius</i>	Zebra Butterfly	20	-	20	-	0/0	0/0/0	1/na
<i>Heliconius melpomene</i>	Postman Butterfly	-	nr	nr	-	0/0	0/0/0	na/na
<i>Greta oto</i>	Clearwing Butterfly	6	-	6	-	0/0	0/0/0	1/na
Hymenoptera								
<i>Ampulex compressa</i>	Jewel Wasp	-	nr	nr	-	nr/nr	28/25/0	A/B
<i>Apis mellifera</i>	Honeybee	2	-	3	-	nr/nr	0/0/1	C/M
<i>Atta cephalotes</i>	Leaf-cutting Ant	-	-	-	-	0/0	0/0/2	C/M
<i>Formica rufa</i> (VU)	Red Wood Ant	-	-	-	-	0/0	0/0/1	C/M
Hemiptera								
<i>Platymeris biguttata</i>	Assassin Bug	-	nr	nr	-	70/0	0/0/1	1/0

AQUATIC INVERTEBRATES (Aquarium) (numbers held at 31.12.98)

		many
<i>Actinia equina</i>	Beadlet Anemone	many
<i>Stichodactylus giganteum</i>	Carpet Anemone	1
<i>Protoreaster lincki</i>	Crimson Knobbled Starfish	2
<i>Asteria gibbosa</i>	Cushion Starfish	-50
<i>Diadema setosum</i>	Long-spine Urchin	7
<i>Pomacea pallidus</i>	Apple Snail	6
<i>Astrae tectum</i>	Turbo Snail	5
<i>Octopus vulgaris</i>	Common Octopus	1
<i>Sepia officinalis</i>	Cuttlefish	1
<i>Lysmata debelius</i>	Blood Shrimp	8
<i>Cancer pagurus</i>	Edible Crab	8
<i>Maia squinado</i>	Spider Crab	9
<i>Carcinus maenas</i>	Shore Crab	-10
<i>Dardanus megistos</i>	Red Hairy Hermit	2
<i>Homarus gammarus</i>	Lobster	3
<i>Galathea strigosa</i>	Squat Lobster	6
<i>Limulus polyphemus</i>	Horseshoe Crab	3

The following invertebrates were held in the Ambika Paul Children's Zoo and Education Department at 31.12.98:

		0/0/22
<i>Achatina fulica</i>	Giant Land Snails	0/0/22
<i>Grammostola spatulata</i>	Chile Rose Spider	0/2
<i>Caranus morosus</i>	Indian Stick Insect	0/7
<i>Gromphadorhina portoricensis</i>	Malagasy Hissing Cockroaches	>50

Total Invertebrates at 31.12.98: approx. 5766 specimens; 5 colonies; approx. 119 species

WHIPSADE WILD ANIMAL PARK

		1	2	3	4	5	6	7
MAMMALS								
Diprotodontia								
<i>Macropus rufogriseus frontalis</i>	Red-necked (Bennett's) Wallaby**	-550	-	-	-	-	-	-600
<i>Macropus rufogriseus</i>	White Wallaby	16	1	2	-	2	1	8/8
<i>Macropus parma</i>	White-fronted Wallaby	2	-	1	-	-	-	1/2
Primates								
<i>Lemur catta</i> (VU)	Ring-tailed Lemur	6	-	-	-	-	-	6/0
<i>Varecia variegata variegata</i> (EN)	Black-&-white Ruffed Lemur	2	-	-	-	-	-	1/1
<i>Varecia variegata rubra</i> (CR)	Red Ruffed Lemur	2	-	-	-	-	-	2(2)
<i>Pithecia pithecia</i>	White-faced Saki Monkey	2	-	-	-	-	-	1/1
<i>Saimiri boliviensis</i>	Black-capped Squirrel Monkey	13	2	2	1	4	1	4/7
<i>Callithrix argentata argentata</i>	Silvery Marmoset	2	-	1	-	-	-	1/1/1
<i>Leontopithecus chrysomelas</i> (EN)	Golden-headed Lion Tamarin	4	-	-	-	-	-	3/1
<i>Pan troglodytes</i> (EN)	Chimpanzee	9	-	-	-	-	-	6/3
Rodentia								
<i>Cynomys ludovicianus</i>	Black-tailed Prairie Dog**	-100	-	-	-	-	-	-100
<i>Dolichotis patagonum</i>	Mara**	-188	-	-	-	-	-	-210
<i>Muscardinus avellanarius</i> (RT)	Common Dormouse	-	5	6	-	1	-	5/5
Carnivora								
<i>Canis lupus</i>	Grey Wolf	20	-	-	-	6	-	7/7
<i>Ursus arctos</i>	Brown Bear	5	-	-	-	-	-	1/4
<i>Ailuropus fulgens fulgens</i> (EN)	Red Panda	2	6	3	2	-	1	2/6
<i>Helogale parvula</i>	Dwarf Mongooses	7	-	2	2	2	-	2/3
<i>Panthera leo</i>	Lion	1	-	-	-	1	-	-
<i>Panthera tigris altaica</i> (CR)	Amur (Siberian) Tiger	2	-	-	-	-	-	1/1
<i>Acinonyx jubatus</i> (VU)	Cheetah	5	2	-	-	1	1	3/2
Pinnipedia								
<i>Zalophus californianus</i>	California Sealion	3	-	1	1	-	-	1/2
<i>Phoca vitulina</i>	Common Seal	1	-	-	-	-	-	1/0
<i>Halichoerus grypus</i>	Grey Seal	1	-	-	-	-	-	0/1
Proboscidea								
<i>Elephas maximus</i> (EN)	Asian Elephant	4	-	-	-	-	-	1/3
Perissodactyla								
<i>Equus burchelli chapmani*</i>	Chapman's Zebra	1	-	-	-	-	-	1/0
<i>Equus grevy*</i> (EN)	Grevy's Zebra	9	-	-	-	-	1	1/7
<i>Equus hemionus onager*</i> (EN)	Asiatic Wild Ass	8	-	-	-	-	-	1/7
<i>Equus przewalskii*</i> (EW)	Przewalski's Horse	11	3	-	-	2	5	0/7
<i>Rhinoceros unicornis</i> (EN)	Greater One-horned Rhinoceros	2	2(2)	-	-	-	-	1/3
<i>Ceratotherium simum simum</i>	Southern White Rhinoceros	9	-	-	-	-	-	2/7
<i>Diceros bicornis michaeli</i> (CR)	Black Rhinoceros	2	1	-	-	-	1	1/1
Artiodactyla								
<i>Hippopotamus amphibius</i>	Hippopotamus	3	-	-	-	-	-	2/1
<i>Hexaprotodon liberiensis</i> (VU)	Pygmy Hippopotamus	3	-	2	-	1	-	1/3
<i>Lama glama*</i>	Llama (domestic)	2	-	-	-	-	-	2/0
<i>Lama pacos</i>	Alpaca (domestic)	-	2	-	-	-	-	2/0
<i>Camelus bactrianus</i>	Bactrian Camel (domestic)	14	1(1)	3	-	1	1(1)	5/11
<i>Muntiacus reevesi</i>	Reeve's Muntjac**	-18	-	-	-	-	-	-20
<i>Dama dama</i>	Fallow Deer	25	-	7	2	8	-	9/13

		1	2	3	4	5	6	7
<i>Dama dama</i>	Fallow Deer (black form)**	-55	-	-	-	-	-	-54
<i>Axis axis</i>	Axis Deer	45	-	21	13	12	-	12/23/6
<i>Axis porcinus*</i>	Hog Deer	41	-	15	12	10	-	10/17/7
<i>Cervus davidsoni*</i> (VU)	Barasingha/Swamp Deer	31	-	11	3	-	-	16/22/1
<i>Cervus nippon*</i>	Sika Deer	22	-	6	2	3	-	7/15/1
<i>Elaphurus davidianus*</i> (CR)	Père David's Deer	29	-	15	3	13	-	4/16/8
<i>Rangifer tarandus</i>	Reindeer (domestic)	3	2(1)	-	-	1	-	1/3
<i>Hydropotes inermis</i>	Chinese Water Deer**	-400	-	-	-	-	-	-500
<i>Giraffa camelopardalis reticulata*</i>	Reticulated Giraffe	6	-	1	-	1	-	3/3
<i>Tragelaphus angasi*</i>	Nyala	11	-	2	2	1	-	3/7
<i>Tragelaphus spekei*</i>	Sitatunga	18	-	10	2	1	-	10/15
<i>Tragelaphus streptoceros</i>	Greater Kudu	-	7(7)	3	-	1	-	2/6
<i>Boselaphus tragocamelus*</i>	Nilgai	15	-	-	-	-	-	1/14
<i>Bubalus depressicornis*</i> (EN)	Lowland Anoa	3	-	-	-	-	-	2/1
<i>Bos gaurus*</i> (VU)	Gaur	2	-	-	-	1	-	1/0
<i>Bos grunniens</i>	Yak (domestic)	24	-	12	2	6	-	4/24
<i>Syncerus caffer namus*</i>	Dwarf Forest Buffalo	6	-	1	-	1	-	2/4
<i>Bison bison bison</i>	American Prairie Bison	3	-	1	-	-	-	2/1/1
<i>Bison bonasus</i> (EN)	European Bison	9	-	-	-	1	-	1/7
<i>Hippotragus equinus*</i>	Ross Antelope	8	1	-	-	-	-	5/4
<i>Kobus ellipsiprymnus*</i>	Common Waterbuck	7	-	-	-	-	-	1/6
<i>Kobus megaceros</i>	Nile Lechwe	10	-	3	1	1	-	5/6
<i>Oryx gazella gazella*</i>	Gemsbok	11	-	4	1	1	-	5/8
<i>Oryx dammah*</i> (CR)	Scimitar-horned Oryx	16	-	11	3	-	-	4/20
<i>Antelope cervicapra*</i> (VU)	Blackbuck	19	-	7	3	2	1	5/13/2
<i>Ovis montanus</i>	Musk Ox	1	-	-	-	-	-	0/1
<i>Ovis orientalis musimon</i> (VU)	Mouflon	1	-	-	-	-	-	0/1
Domestic								
Horse	Shire	1	-	-	-	-	-	1/0
	Cream Pony	2	-	-	-	-	-	1/1
	Welsh Pony (Cream form)	1	-	-	-	-	-	1/0
Pig	Oxford Sandy x Black Pig	1	-	-	-	-	-	0/1
	Pot-bellied Pig	2	-	-	-	-	-	0/2
Cattle	Belted Galloway	1	-	-	-	-	-	1/0
	Red Poll	1	-	-	-	-	-	0/1
Sheep	Lincoln Longwool	2	-	-	-	-	1	0/1
	Hampshire	10	-	-	-	-	-	0/10
	Black-faced	1	-	-	-	-	-	1/0
Goat	Windsor White	14	-	6	-	1	-	7/12
	Pygmy	3	2	-	-	-	-	0/5
Total Mammals		1889	37(11)	159	55	86	17(5)	2190

BIRDS

Casuariformes

<i>Dromaius novaehollandiae</i>	Emu	11	1(1)	3	2	1	1	7/2/2
---------------------------------	-----	----	------	---	---	---	---	-------

Sphenisciformes

<i>Aptenodytes patagonica</i>	King Penguin	10	-	-	-	1	-	4/5
<i>Eudyptes creatatus creatatus</i>	Rockhopper Penguin	15	-	2	-	-	-	8/7/2
<i>Spheniscus humboldti</i>	Humboldt's Penguin	50	-	7	-	-	17	17/23

		1	2	3	4	5	6	7
Ciconiiformes								
<i>Ciconia ciconia ciconia</i>	White Stork	14	-	2	-	-	-	3/5/8
<i>Eudocimus ruber</i>	Scarlet Ibis	18	-	4	-	4	5(4)	5/8
<i>Phoenicopterus ruber ruber</i>	Rosy Flamingo	42	-	4	1	2	-	0/0/43
<i>Phoenicopterus ruber roseus</i>	Greater Flamingo	-	1	-	-	-	-	0/0/1
Anseriformes								
<i>Cygnus atratus</i>	Black Swan	2	-	3	-	1	-	1/0/3
<i>Cygnus cygnus</i>	Whooper Swan	2	-	-	-	-	-	1/1
<i>Coscoroba coscoroba</i>	Coscoroba Swan	2	-	-	-	-	-	1/1
<i>Anser cygnoides</i> (VU)	Swan Goose	-	6	-	-	-	-	3/3
<i>Anser indicus</i>	Bar-headed Goose	34	-	1	-	-	-	4/7/24
<i>Anser erythropus</i> (VU)	Lesser White-fronted Goose	-	6	-	-	1	-	3/2
<i>Anser canagicus</i>	Emperor Goose	3	2	-	-	1	-	3/1
<i>Anser rossi</i>	Ross' Goose	-	3	2	-	1	-	2/2
<i>Branta leucopsis</i>	Barnacle Goose	2	-	-	-	1	-	0/0/1
<i>Branta ruficollis</i> (VU)	Red-breasted Goose	4	-	-	-	-	-	2/2
<i>Branta sandvicensis</i> (VU)	Nene (Hawaiian Goose)	2	-	-	-	1	-	1/0
<i>Alopochen aegyptiaca</i>	Egyptian Goose	1	-	-	-	-	-	0/0/1
<i>Dendrocygna viduata</i>	White-faced Whistling Duck	-	4	-	-	3	-	0/1
<i>Tadorna tadorna</i>	Common Shelduck	8	-	-	-	2	-	2/4
<i>Aix galericulata</i>	Mandarin Duck	21	-	9	1	1	-	11/8/9
<i>Aix sponsa</i>	North American Wood Duck	14	-	2	-	1	-	8/7
<i>Chenonetta jubata</i>	Australian Wood Duck	4	-	-	-	1	-	2/1
<i>Callonetta leucophrys</i>	Ringed Teal	15	-	3	2	2	1	4/7/2
<i>Anas americana</i>	American Wigeon	4	-	-	-	-	-	2/2
<i>Anas bahamensis</i>	Bahama Pintail	5	-	-	-	-	1	2/2
<i>Anas falcata</i>	Falcated Duck	-	3	-	-	1	-	1

		1	2	3	4	5	6	7
<i>Pavo cristatus</i>	Common Peafowl**	-210	-	-	-	-	-	-150
<i>Lophura edwardsi</i> (CK)	Edward's Pheasant	1	-	-	-	-	-	1/0
<i>Crossoptilon mantchuricum</i> (VU)	Brown Eared Pheasant	2	-	-	-	-	-	1/1
Gruliformes								
<i>Grus japonensis</i> (VU)	Red-crowned Crane	4	-	-	-	-	-	1/3
<i>Grus vipio</i> (VU)	White-naped Crane	7	-	-	-	-	3	2/2
<i>Grus rubicunda</i>	Bronze	3	-	1	1	-	-	2/1
<i>Grus paradisea</i> (VU)	Stanley Crane	3	-	6	2	-	-	1/2/4
<i>Grus carunculatus</i> (VU)	Wattled Crane	4	-	-	-	1	-	2/1
<i>Caranius cristata</i>	Red-legged Seriema	1	-	-	-	-	-	1/0
<i>Otus tarda tarda</i> (VU)	Great Bustard	1	-	-	-	-	-	1/0
Charadriiformes								
<i>Haematopus ostralegus</i>	Eurasian Oystercatcher	4	-	-	-	-	-	0/0/4
<i>Burhinus bistriatus</i>	Double-striped Thick-knee	2	-	-	-	-	-	1/1
<i>Himantopus himantopus mexicanus</i>	Black-necked Stilt	2	-	-	-	-	-	1/0/1
Psittaciformes								
<i>Psittacus erithacus erithacus</i>	Grey Parrot	1	-	-	-	-	-	1/0
<i>Agapornis personata</i>	Masked Lovebird	4	-	-	-	-	-	0/0/4
<i>Psittacula eupatria</i>	Alexandrine Parakeet	2	-	-	-	1	1	-
<i>Ara araxana</i>	Blue-&yellow Macaw	2	1	-	-	-	-	2/0/1
<i>Ara macao</i>	Scarlet Macaw	2	-	-	-	-	-	2/0
<i>Ara militaris</i> (VU)	Military Macaw	-	5	-	-	-	-	0/0/5
<i>Myiopitta monachus</i>	Monk Parakeet	2	-	-	-	-	-	1/1
Strigiformes								
<i>Tyto alba</i>	Barn Owl	1	-	-	-	-	-	0/1
<i>Otus leucotis</i>	White-faced Scops Owl	2	-	-	-	1	-	0/1
<i>Bubo bubo bengalensis</i>	Bengal Eagle Owl	1	-	-	-	-	-	0/1
<i>Nyctea scandiaca</i>	Snowy Owl	2	-	-	-	1	-	1/0
<i>Strix aluco sylvatica</i>	Tawny Owl	2	-	1	-	-	-	1/1/1
<i>Strix uralensis</i>	Ural Owl	2	-	-	-	1	-	1/0
<i>Speotyto cunicularia</i>	Burrowing Owl	1	-	-	-	-	-	0/0/1
Coraciiformes								
<i>Dacelo novaeguineae</i>	Kookaburra	1	-	-	-	-	-	0/0/1
<i>Coracias caudata</i>	Lilac-breasted Roller	1	-	-	-	-	-	1/0
<i>Tockus erythrorhynchus</i>	Red-billed Hornbill	2	-	-	-	1	-	0/1
Piciformes								
<i>Ramphastos vitellinus citreolaemus</i>	Citron-throated Toucan	1	-	-	-	-	-	0/1
Passeriformes								
<i>Spreo superbus</i>	Superb Starling	-	3	-	-	-	1	1/1
Total: Birds		674	41(1)	70	17	41	31(4)	621

REPTILES

Testudines

<i>Terrapene carolina</i>	Three-toed Box Turtle	2	-	-	-	-	2	-
<i>Testudo hermanni</i>	Hermann's Tortoise	18	1	10	1	1	-	3/11/13
<i>Testudo kleinmanni</i> (EN)	Egyptian Tortoise	7	-	2	1	-	-	5/2/1
<i>Testudo horsfieldi</i> (VU)	Central Asian Tortoise	8	-	-	-	1	-	3/3/1
<i>Chelonia fimbriata</i>	Matamoras	2	-	-	-	-	-	0/0/2

Crocodylia

<i>Osteoleaemus tetraspis</i> (VU)	West African Dwarf Crocodile	2	-	4	-	-	-	1/1/4
------------------------------------	------------------------------	---	---	---	---	---	---	-------

Sauria

<i>Phelsuma standingi</i> (VU)	Standing's Day Gecko	2	-	-	-	-	-	1/1
<i>Eublepharis macularius</i>	Leopard Ground Gecko	10	-	18	-	-	19	0/0/9
<i>Basiliscus plumifrons</i>	Plumed Basilisk	6	-	-	-	1	4	0/1/0
<i>Iguana iguana</i>	Common Iguana	2	-	-	-	-	-	0/2
<i>Mabuya perrotetti</i>	Red-sided Skink	5	-	-	-	1	-	1/0/3
<i>Uromastyx hardwickii</i>	Indian Spiny-tailed Lizard	4	-	-	-	-	-	0/0/4
<i>Chamaeleo calyptratus</i>	Yemen Chameleon	6	-	50	18	13	8(1)	0/0/17
<i>Varanus albigularis</i>	Bosc's Monitor	2	-	-	-	-	-	1/0/1

Serpentes

<i>Python molaris bivittatus</i>	Burmese Python	1	-	-	-	-	-	0/1
<i>Corallus enydus cooki</i>	Cook's Tree Boa	3	-	-	-	-	-	1/2
<i>Eryx johnii</i>	Smooth Sand Boa	2	-	-	-	-	-	2/0
<i>Echis carinatus</i>	Saw-scaled Viper	3	-	-	-	2	-	0/0/1

Total: Reptiles 85 1 84 20 19 33(1) 98

AMPHIBIANS

Anura

<i>Dendrobates auratus</i>	Green-&-black Poison Frog	24	-	16	-	3	-	0/0/37
<i>Dendrobates pumilio</i>	Strawberry Poison Frog	8	-	-	-	-	-	0/0/8
<i>Dendrobates azureus</i>	Blue Poison Frog	5	-	2	-	3	-	2/0/2
<i>Dendrobates leucomelas</i>	Yellow-banded Poison Frog	3	-	-	-	1	-	0/0/2
<i>Dendrobates truncatus</i>	Yellow-&-black Poison Frog	16	12	11	-	1	7(6)	1/2/28
<i>Ceratophrys cranwelli</i>	Chacon Horned Frog	1	-	-	-	-	-	1/0
<i>Ceratophrys ornata</i>	Omate Horned Frog	1	-	-	-	1	-	-

Total: Amphibians 58 12 29 - 9 7(6) 83

The numbers given for fishes and invertebrates at Whipnade represent the numbers held at the end of 1998

FISHES

Characiformes

<i>Serrasalminus nattereri</i>	Red-bellied Piranha	20
<i>Cheirodon axelrodi</i>	Cardinal Tetra	40
<i>Micralestes interruptus</i>	Congo Tetra	6

Cypriniformes

<i>Barbodes schwanenfeldi</i>	Tinsel Barb	6
<i>Labeo chrysophekadion</i>	Black Shark	1
<i>Oryzias latipes</i>	Sucking Loach	2

Cyprinodontiformes

<i>Poecilia spp</i>	Molly	Colony
<i>Xiphophorus variatus variatus</i>	Platy	Colony
<i>Xiphophorus helleri</i>	Red Swordtail	Colony

Gasterosteiformes

<i>Hippocampus sp.</i>	Seahorse	11
------------------------	----------	----

Gymnotiformes

<i>Electrophorus electricus</i>	Electric Eel	1
---------------------------------	--------------	---

Perciformes

<i>Neochromis greenwoodi</i>	Velvet Black Lake Victoria Cichlid	20
<i>Astronotus ocellatus</i>	Oscar	1
<i>Zebrafish</i>	Yellow Sailfin Tang	1
<i>Monodactylus argenteus</i>	Silver Fish	28
<i>Chrysiptera parasema</i>	Yellow-tailed Blue Damselfish	4
<i>Pterapogon kauderni</i>	Mandarin Fish	2
<i>Amphiprion percular</i>	Percular Clownfish	5
<i>Amphiprion clarkii</i>	Clark's Clownfish	3
<i>Amphiprion melanopus</i>	Pacific Fire Clownfish	2
<i>Chromis viridis</i>	Blue-green Chromis	4
<i>Ptereleotris zebra</i>	Shotsilk Goby	1
<i>Ptereleotris evides</i>	Torpedo Goby	1
<i>Meiacanthus ovalanensis</i>	Canary Blenny	1
<i>Anthias squamipinnis</i>	Lycetail Coralfish	1
<i>Tilapia sp.</i>	Tilapia	Colony

Siluriformes

<i>Otocinclus vittatus</i>	Dwarf Sucker Catfish	2
<i>Otocinclus affinis</i>	Dwarf Sucker Catfish	3
<i>Plecostomus sp.</i>	Plecostomus Catfish	8

Total Fishes: approx. 29 species; approx. 174 specimens; 4 colonies

INVERTEBRATES

ARACHNIDA

Araneae

<i>Brachypelma smithi</i>	Red-kneed Bird-eating Spider	5
<i>Grammostola cala</i>	Chile Rose Bird-eating Spider	1
<i>Lasiodora parahybana</i>	Brazilian Bird-eating Spider	1
<i>Statoda albomaculata</i>	Gambian False Widow Spider	Colony
<i>Heteropoda venatoria</i>	Huntsman Spider	1

Scorpiones

<i>Pandinus imperator</i>	Imperial Scorpion	8
<i>Pandinus sp.</i>	Scorpion	2
Unidentified bathid	Desert Scorpion	4

Uropygi

<i>Mastigoproctus giganteus</i>	American Whip Scorpion	4
---------------------------------	------------------------	---

MYRIAPODA

Chilopoda

<i>Scolopendra sp.</i>	Giant Centipede	2
<i>Scolopendra heros</i>	Giant Centipede	4

Diplopoda

<i>Cambula annulata</i>	Giant Millipede	Colony
-------------------------	-----------------	--------

INSECTA

Orthoptera

<i>Schistocerca gregaria</i>	Desert Locust	Colony
<i>Gryllus bimaculatus</i>	African Field Cricket	Colony
<i>Pholegryllus geertsi</i>	Cave Cricket	Colony

Blattodea

<i>Gromphadorhina portentosa</i>	Malagasy Hissing Cockroach	Colony
----------------------------------	----------------------------	--------

Coleoptera

<i>Oryctes nasicornis</i>	European Rhino Beetle	Larvae
<i>Eudicella grallithyrus</i>	Fruit Chafer Beetle	Colony
<i>Eudicella woermanni</i>	Fruit Chafer Beetle	Colony
<i>Pachnoda nactigali</i>	African Sun Beetle	Colony

Lepidoptera

<i>Heliconius melpomene</i>	Postman Butterfly	Colony
<i>Heliconius charitonius</i>	Zebra Butterfly	Colony
<i>Pareutype barberata</i>	Barberry Carpet Moth	Colony

Hymenoptera

<i>Acromyrmex octospinosus</i>	Leaf-cutter Ants	Colony
<i>Atta cephalotes</i>	Leaf-cutter Ants	Colony

MARINE INVERTEBRATES

<i>Sichodactyla sp.</i>	Carpet Anemone	1
<i>Ophiocoma sp.</i>	Brittle Starfish	1
<i>Clibanarius vittatus</i>	Hermit Crab	4
<i>Lysmata debelius</i>	Blood Shrimp	2

Total Invertebrates: approx. 40 specimens; 14 colonies; + larvae; approx. 29 species

SUMMARY

	1	2	3	4	5	6	7	Number of species (excluding domestic) at 31.12.98
London Zoo								
Mammals	926	93 (3)	581	52	512	346 (11)	690	87
Birds	667	187 (4)	180	71	168	97 (1)	698	136
Reptiles	469	54 (1)	122	5	132	49	459	105
Amphibians	172	51 (6)	10	1	88	-	144	14
Fishes	2739	511	633	-	846	246	2791	196
Total	4973	896 (14)	1526	129	1746	738 (12)	4782	538

Domestics: Mammals - 15 species; Birds - 3 species

In addition: one colony of fishes (individuals not counted)

Estimated number of invertebrates in the Collection at 31 December 1998:

Invertebrates Approx. 5766 specimens (+ 5 colonies). Approx. 119 species

Whipsnade Wild Animal Park

Mammals	1889	37 (11)	159	55	86	17 (3)	2100	58
Birds	674	41 (1)	70	17	41	31 (4)	621	82
Reptiles	85	1	84	20	19	33 (1)	98	17
Amphibians	58	12	29	-	9	7 (6)	83	6
Total	2706	91 (12)	342	92	155	88 (14)	2902	163

Note: Births, deaths, arrivals and departures of free-ranging animals at Whipsnade are not recorded.

Domestics: Mammals - 10 species

Estimated number of fishes and invertebrates in the Collection at 31 December 1998:

Fishes Approx. 174 specimens (+ 4 colonies) 29 species
Invertebrates Approx. 40 specimens (+ 14 colonies; + larvae) 29 species

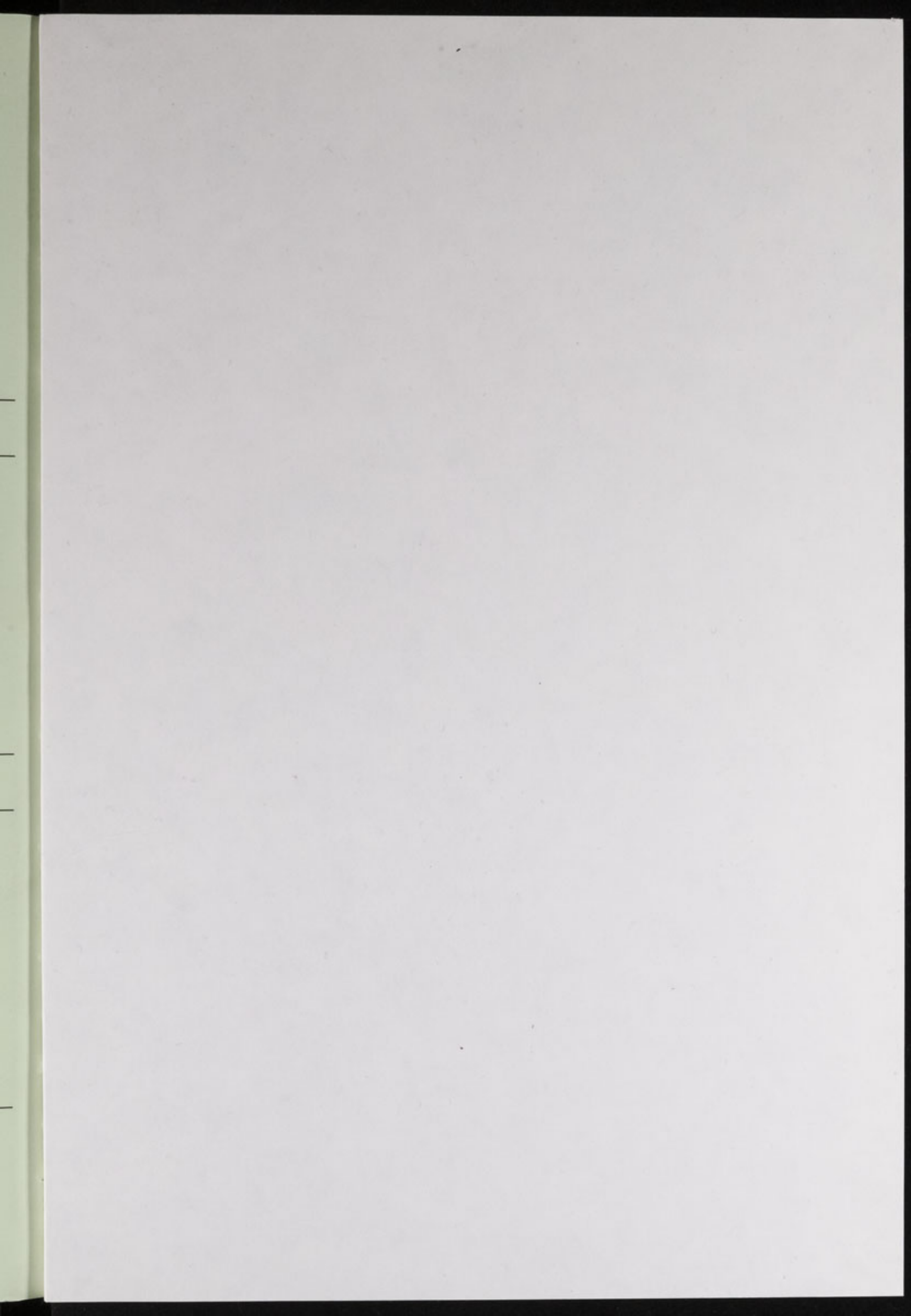
Grand Total Zoological Society of London

7679	987	1868	221	1901	826	7685	652* excl. fishes at Whipsnade
------	-----	------	-----	------	-----	------	--------------------------------------

Grand Total of fishes: approx. 2965 specimens (+ 5 colonies) of 216 species*

Grand Total of invertebrates: approx. 5806 specimens (+ 19 colonies) of 135 species*

* The species common to London Zoo and Whipsnade Wild Animal Park are counted as one





ZOOLOGICAL SOCIETY OF LONDON

