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Secretary of State's Standards of Modern Zoo Practice

March 2000
Department of the Environment, Transport and the Regions

Department of the Environment, Transport and the Regions
Eland House
Bressenden Place
London SW1E 5DU
Telephone 0171 890 3000
Internet service http://www.detr.gov.uk

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APPENDICES

SECTION 1

Introduction

1. In pursuance of section 9 of the Zoo Licensing Act 1981, the Secretary of State, having consulted such persons on a list compiled under Section 8 of the Act, and other persons as he has seen fit, hereby specifies the following Standards of Modern Zoo Practice; that is, Standards with respect to the management of zoos and the animals in them. Due to the widely differing nature of zoo collections, not every Standard will apply equally to all zoos.

2. Compliance with these Standards does not guarantee that the requirements of the Health and Safety at Work etc Act 1974 and other relevant legislation have been met. In particular, attention is drawn to the Approved Code of Practice and Guidance Note issued by the Health and Safety Commission, relating to safety, health and welfare standards for employers and persons at work in zoos. Zoo operators are strongly advised to acquaint themselves with these requirements and other relevant legislation including that on transport of animals, fire prevention and food hygiene.

Interpretation of terms used

3. The following terms as defined here are used in these Standards and in associated documentation.

- 'animal' means any mammal, bird, reptile, amphibian, fish, insect or other multi-cellular organism that is not a plant or fungus;
- 'animal training' is the modification of an animal's behaviour by a human carer to achieve a goal, using appropriate rewards;
- 'circus' means a place where animals are kept or introduced wholly or mainly for the purpose of performing tricks or manoeuvres at that place;
- 'enclosure' means any accommodation provided for zoo animals;
- 'enclosure barrier' means a physical barrier to contain an animal within an enclosure;
- 'keeper' includes any person employed under the direction of an operator or an appointed agent ;
- 'the list' means the list compiled by the Secretary of State under section 8 of the Zoo Licensing Act 1981 of persons responsible for the inspection of animals in zoos, advising on their keeping and welfare, and management of zoos generally;
- 'pet shop' means premises for whose keeping as a pet shop a licence is required under the Pet Animals Act 1951;
- 'stand-off barrier' means a physical barrier set back from the outer edge of an enclosure barrier in order to provide further distance between the public and exhibited animals;

- 'taxonomic category' means a group or assemblage of species recognised as an entity in scientific classification;

- 'wild animal' means any animal not normally domesticated in Great Britain;

- "Zoo" is defined under section 21 of the Zoo Licensing Act 1981 as an establishment where wild animals are kept for exhibition to the public otherwise than for purposes of a circus and otherwise than in a pet shop; and this Act applies to any zoo to which members of the public have access, with or without charge for admission, on more than seven days in any period of 12 consecutive months". Following implementation of the EU Zoos Directive (on or before 9 April 2002) the definition will become "all permanent establishments where live animals of wild species are kept for exhibition to the public for 7 or more days a year, with the exception of circuses, pet shops and establishments which Member States exempt from the requirements of this Directive on the grounds that they do not exhibit a significant number of animals or species to the public and that the exemption will not jeopardise the objectives of this Directive".

Animal Welfare in the Zoo Environment

4. The five principles below, described in more detail in subsequent sections, provide a framework for the Secretary of State's Standards of Modern Zoo Practice. These five principles are based on the 'Five Freedoms' drawn up for livestock by the Farm Animal Welfare Council.

PROVISION OF FOOD AND WATER

5. Both food and water are basic needs. The method of food presentation, the frequency of feeds and the nutritional balance must be taken into account. Food should be presented in a manner and frequency commensurate with the natural behaviour of the species, as well as its nutritional requirements, which may vary according to season.

PROVISION OF A SUITABLE ENVIRONMENT

6. An environment consistent with species requirements must be provided. This should include shelter from rain, heat, cold and shade as appropriate. For example, animals that dig and root must be provided with suitable substrates, and climbers with appropriate three dimensional environments. A balance must be struck between hygiene and the species' biological requirements.

PROVISION OF ANIMAL HEALTHCARE

7. Injury: The provision of an enclosure designed to minimise the risk of injury is required. The design should allow animals to get away from each other. In mixed species' exhibits, care should be taken that one species cannot injure another. Enclosures should be designed to minimise the risk of predators entering the exhibit.

8. Disease: Curative and preventive veterinary medicine should be provided. Every effort must be made to provide a correct diet and suitably hygienic environment from which pathogens are excluded or controlled.

PROVISION OF AN OPPORTUNITY TO EXPRESS MOST NORMAL BEHAVIOUR

9. Animals should be allowed the opportunity to express most normal behaviour, taking into account current enrichment and husbandry guidelines.

PROVISION OF PROTECTION FROM FEAR AND DISTRESS

10. Particular areas to look at are: group composition, sex ratios and numbers of animals in an enclosure and space and furniture in both indoor and outdoor areas. Zoo animals are often confined for long periods in indoor area and the group composition should reflect this situation.

11. Enclosure design should allow for as much normal behaviour as possible, and provide areas of escape from other animals and the public.

12. Animals often benefit from mixed species environments. However, inter-species conflict can cause stress and this needs to be monitored, recorded and reviewed, including safety from potential predators.

SECTION 2

Secretary of State's Standards

1. Provision of Food and Water

1.1 Food provided must be presented in an appropriate manner and must be of the nutritive value, quantity, quality and variety for the species, and its condition, size and physiological, reproductive and health status.

1.2 Fresh, clean drinking water of sufficient quantity must be available at all times for all animals requiring it.

1.3 Supplies of food and drink to be kept and prepared under hygienic conditions, in particular –

a) food and drink must be protected against dampness, deterioration, mould or from contamination by insects, birds, vermin or other pests;

b) supplies of perishable food and drink, other than those brought into the premises fresh on a daily basis, should be kept, where appropriate, under refrigeration;

c) preparation of food and, where appropriate, drink should be undertaken in a separate area suitably designed and constructed, and used for no other purpose;

d) staff should be instructed to observe strict standards of personal hygiene and should conform to good hygiene practice in the preparation of food, having due regard to the risk of cross contamination between equipment, utensils and surfaces;

e) receptacles for food and drink should not to be used for any other purposes.

1.4 The natural behaviour of the animals, particularly social aspects, should be considered when offering food and drink. Feeding and drinking receptacles, when used, should be of appropriate design and placed so as to be accessible and available to every animal kept in an enclosure.

(See Appendix 8 – Specialist Exhibits)

1.5 Feeding methods should be safe for animals and staff.

1.6 Although the Protection of Animals Acts 1911 to 1964 do not prohibit the feeding of animals with live prey, the live feeding of vertebrate prey should be avoided save in exceptional circumstances, and then only under veterinary advice. Where any live prey must be used, its welfare must be considered as well as any potential injury which might be caused to the predator.

1.7 Food and drink, and feeding and drinking receptacles when used, should be placed in positions which minimise the risks of contamination from soiling by the animals, wild birds, rodents or other pests.

1.8 Food, water and other drinking receptacles, where used, should be regularly cleaned.

1.9 Self-feeders, where used, should be inspected twice daily to ensure that they are working effectively and do not contain caked or unfit food. Water lines should also be checked twice a day.

1.10 Uncontrolled feeding of animals by visitors should not be permitted. Where controlled feeding occurs, it should be on a selective basis only, with suitable food sold, provided or approved by the operator. The quantity supplied per day must be managed to avoid over feeding.

1.11 Uneaten food must be removed as appropriate to maintain hygiene.

1.12 Veterinary or other specialist advice in all aspects of nutrition must be obtained and followed.

1.13 A record of all diets must be maintained.

2. Provision of a Suitable Environment

2.1 The temperature, ventilation, lighting (both levels and spectral distribution) and noise levels of enclosures must be suitable for the comfort and well-being of the particular species of animal at all times. In particular-

a) consideration must be given to the special needs of pregnant and newly-born animals;

b) newly-arrived imported animals should be allowed to become fully acclimatised into their new environment. In some cases, this may be a gradual process;

c) tanks for aquatic animals need to be adequately aerated, according to the number kept in each tank, and must be heated or cooled according to the needs of the species. Environmental parameters (e.g. salinity, water quality) must be suitable for the species;

d) indoor housing must protect against extremes of sunlight, heat, draughts and cold, and provide appropriate humidity;

e) ehere appropriate, salinity and other physical limits (e.g. water quality) must be suitable for the species.

(See Appendix 8 – Specialist Exhibits)

2.2 Animals in outdoor enclosures must be provided with sufficient shelter for their comfort and well-being. Refuge areas must be provided for nervous animals to escape the permanent gaze of the public. Enclosures must also be designed to allow for animals' normal defence reactions and appropriate 'flight' or escape distances.

2.3 Enclosures and barriers to enclosures must be maintained in a condition which presents no likelihood of harm to animals. In particular:

a) any defect noted in an enclosure barrier or in any appliances or equipment within animal enclosures likely to cause harm must be repaired, or replaced or the animal relocated immediately and recorded on keepers' daily record sheets;

b) any defect likely to cause harm to animals must be rectified at once. If this is not possible, the animals should be removed from the possibility of any contact with the source of the danger until rectified;

c) any vegetation capable of harming animals must be kept out of reach;

d) water-filled and dry moats used for the confinement of animals must provide a means of escape back to the enclosure for animals falling into them;

e) any natural materials (e.g. plants and their products, such as seeds or fruit) or any introduced non-natural materials (e.g. paint, chemicals, treated substrates and treated water) should be assessed for toxicity to the species held before use.

2.4 All plant and fixed equipment, including electrical apparatus, must be installed and maintained in such a way that they do not present a hazard to animals, and their safe operation cannot be disrupted by them.

2.5 Where environmental quality is dependent on external utilities, adequate backup facilities must exist in case of failure.

2.6 Adequate provision must be made for servicing, maintenance and uninterrupted operation of life-support systems.

2.7 Tools and other portable equipment must not be left unattended in places where they could cause animals harm, provide a means of escape, or serve as missiles.

2.8 Rubbish likely to cause harm in animal enclosures must be cleared as soon as possible.

2.9 Proper standards of hygiene, both in the personal hygiene of staff and in enclosures and treatment rooms should be maintained. In particular:

a) special attention must be given to the management and appropriate cleaning of enclosures and equipment within them, to reduce the risk of disease. In the case of aquatic animals, there should be regular monitoring of water quality;

b) suitable cleaning agents must be readily available, along with supplies of water and the appropriate safe means to apply them;

c) veterinary advice must be obtained and followed regarding the routine cleaning and sanitation requirements of enclosures or other areas. Particular care must be taken if an infectious disease is identified in any animal.

2.10 The drainage of all enclosures should be capable of removing efficiently all excess water.

2.11 Any open drains, other than those carrying surface water, must be outside enclosures.

3. Provision of Animal Health Care

ROUTINE OBSERVATION

3.1 The condition, health and behaviour of all animals should be checked at least twice daily by the person or persons in direct charge of their care.

3.2 Any animals which give cause for concern must be thoroughly assessed as to whether they are unduly distressed, sick or injured. Where necessary they must receive immediate attention and treatment.

3.3 A daily record must be kept by the person or persons in direct charge of the animals, indicating changes to the prescribed diet, health checks carried out, any unusual behaviour or activity or other problems, and remedial actions taken.

ENCLOSURES

3.4 Enclosures must be of a size and design, and animals must be so managed as to:

a) avoid animals within herds or groups being unduly dominated by individuals;

b) avoid the risk of persistent and unresolved conflict between herd or group members, or between different species or age groups in mixed exhibits;

c) ensure that the physical carrying capacity of the enclosure and/or system is not over-burdened;

d) prevent an uncontrolled build-up or spread of parasites and other pathogens;

e) remove any refuse and allow drainage of waste water.

3.5 Trees within or near animal enclosures must be regularly inspected and lopped or felled as necessary to avoid animals being harmed by falling branches, toxicity or trauma. Trees and climbing plants must be pruned to prevent their aiding animal escape.

3.6 Distance or barriers between animals and between enclosures and visitors must be sufficient to minimise transmission of disease or potential pathogens.

VETERINARY CARE

(See Appendix 5 – Veterinary Facilities)

3.7 A comprehensive programme of care must be established and maintained under the supervision of a veterinary surgeon who is familiar with current practice in the care of zoo animals, particularly in the types maintained in the collection. He or she must make arrangements to meet the ethical responsibilities of veterinary cover, set out in Guide to Professional Conduct of the Royal College of Veterinary Surgeons.

3.8 Where a zoo uses a local veterinary practice for basic cover, supported by a specialist (or a specialist supported by a local veterinary practice), adequate advance arrangements must be made to allow early contact and discussion between all parties whenever necessary, and particularly for emergency cases.

3.9 The veterinary surgeon should be responsible for, or actively involved in, the following:–

a) routine inspections of the collection;

b) directing or carrying out treatment of all sick animals;

c) administration of vaccines, worming and other aspects of preventive medicine;

d) health monitoring of animals including submission of blood and other samples for laboratory examination;

e) safe and proper collection, preparation and dispatch of diagnostic and other samples. (Where these tasks are to be carried out by someone other than the veterinary surgeon, a suitably qualified or appropriately trained member of zoo staff should be nominated to carry out the task e.g. a laboratory technician or veterinary nurse);

f) training of zoo personnel in health and hygiene;

g) ensuring that post-mortem examinations of animals are carried out where necessary;

h) supervision of quarantine premises and other such tasks required by law or as part of good zoo veterinary practice;

i) the nutrition and the design of diets;

j) planning and exhibit design;

k) the establishment of written procedures to be followed in the event of the accidental use of dangerous drugs.

3.10 The level of veterinary facilities must be consistent with the welfare needs of the animals.

3.11 Comprehensive records must be kept – where possible on computer – and be made available to Inspectors covering the following:

a) preventive medicine;

b) clinical medicine and surgery;

c) pathological findings from ante-mortem testing. Results of post-mortem examination and testing.

3.12 There must be systems for regular review, by the relevant veterinary and curatorial staff, of clinical, behavioural and pathological records and mortality. Husbandry and preventive medical practices must be reviewed where problems become apparent.

3.13 Zoo management must ensure that the zoo, or a local hospital, or their veterinarian has readily available antidotes to potentially toxic veterinary products used at the zoo.

3.14 A member of staff must be readily available at all times to take decisions regarding the euthanasia of sick animals on veterinary advice. There must be provision of an effective humane method of euthanasia and standard written protocols should be set down.

3.15 Adequate facilities must be available either at the zoo or within a reasonable distance for the post-mortem examination of all species held at the zoo.

3.16 Dead animals must be handled in a way which minimises the risk of transmission of infection.

3.17 Animals that die at the zoo should be examined post-mortem in accordance with veterinary advice. Where appropriate, samples for diagnosis or health monitoring should be taken for laboratory examination.

3.18 Retained samples must be stored in conditions advised by the veterinary surgeon and away from animal feeding substances. The establishment of a reference collection should be encouraged.

ISOLATION & CONTAINMENT

3.19 Dedicated accommodation, off-show where necessary, should be available for the isolation and examination of newly arrived animals, and for the quarantine and care of unduly distressed, sick or injured animals.

3.20 Facilities should be available for hand-rearing and nursing animals.

3.21 Newly-arrived animals should be kept isolated as long as is necessary to ensure proper examination, acclimatisation and quarantine before introduction to other animals in the collection.

(See Appendix 4 – Animal Transactions)

3.22 Particular attention must be paid to hygiene in the quarters where isolated or quarantined animals are kept.

3.23 Protective clothing and utensils used by staff in the isolation area must be used, cleaned and stored only in that area.

SANITATION AND CONTROL OF DISEASE

3.24 Clinical waste and refuse must be regularly removed and disposed of in a manner approved by the Local Authority.

3.25 A safe and effective programme for the control or deterrence of pests and vermin and where necessary predators, must be established and maintained throughout the zoo.

3.26 Health risks posed by the use of power hoses on animal waste must be minimised.

3.27 Staff must be instructed to report in confidence any medical condition or disability which might affect his/her capacity to manage the animals in a safe and competent manner.

SPECIALIST TECHNIQUES

3.28 Specialist techniques used on animals to make them safe for exhibit or to allow them to be exhibited in a particular way (e.g. pinioning waterfowl) must be kept under continual review. Current legislation or codes of practice must be followed.

(See Appendices: 2 – Ethical Review Process; and 8 – Specialist Exhibits)

4. Provision of Opportunity to Express Most Normal Behaviour

4.1 Captive breeding should be encouraged where appropriate and a policy should exist covering all species kept, and be subject to continual review. Appropriate control measures should be put in place to prevent over population.

4.2 Zoos must consult fully and keep up-to-date information on biology and husbandry, especially when considering the keeping of species that they have not housed before, or when planning new housing for species already kept.

4.3 Accommodation should take account of the natural habitat of the species and seek to meet the physiological and psychological needs of the animal.

4.4 Enclosures should be equipped in accordance with the needs of the animals with bedding material, branchwork, burrows, nesting boxes, pools, sub-strates and vegetation and other enrichment materials designed to aid and encourage normal behaviour patterns and minimise any abnormal behaviour. Facilities must take into account growth in animals and must be capable of satisfactorily providing for their needs at all stages of their growth and development.

4.5 Animals of social species should normally be maintained in compatible social groups. They should only be kept isolated for the benefit of the conservation and welfare needs of the group, and where this is not detrimental to the individual specimen.

4.6 Animals of different taxa should not normally be allowed to inter-breed. Where practised for justifiable reasons, it should never compromise the genetic integrity of animals within a managed conservation breeding programme.

4.7 Where a hybrid animal is transferred to another collection, the recipient organisation must be informed that the animal is a hybrid. If practical, the animal should be permanently sterilised prior to transfer.

5. Provision of Protection From Fear and Distress

5.1 Animals must be handled and managed only by, or under the supervision of, appropriately qualified or experienced staff. Handling must be done with care, in order to protect the animals well-being, and avoid unnecessary discomfort, stress or physical harm.

5.2 Any direct physical contact between animals and the visiting public must only be for restricted periods of time and under conditions consistent with animals' welfare, and not likely to lead to their discomfort.

5.3 Animals must not be provoked for the benefit of the viewing public.

(See Appendix 6 – Animal-Contact areas)

5.4 Animals which may interact in an excessively stressful way must not be maintained in close proximity.

5.5 Suitable, separate if appropriate, accommodation for pregnant animals and animals with young should be available in order to minimise unnecessary stress.

5.6 Animals temporarily accommodated away from others should not be separated for such a period of time that there would be difficulties in their re-introduction to the group.

5.7 Animals destined for rehabilitation (e.g. casualty animals) must not be on public display if this is likely to causes stress or compromise their eventual release.

5.8 Smoking by zoo staff and visitors must be prohibited except in designated areas.

6. Transportation and Movement of Live Animals

6.1 Surplus zoo stock should only be passed on to responsible persons who have the appropriate facilities, resources and expertise to ensure the welfare of the animals. Where necessary, the appropriate licences for the keeping and management of the species must be held.

6.2 Facilities suitable for lifting, crating and transportation of all the types of animals kept within the zoo to destinations both inside and outside the zoo should be readily available.

6.3 Zoos must ensure that they comply fully with the requirements of the Convention on International Trade in Endangered Species (CITES) which governs the import, export, sale and other commercial use – including display – of species listed on its Appendices. CITES is implemented within the EU by way of two Regulations which in many respects are stricter that CITES itself. Further information on the CITES Regulations is reproduced in the bibliography. Other considerations to be taken into account when animals are moved to accommodation outside the zoo include:

a) transport must conform with all other current Regulations, including MAFF and IATA provisions.

b) the accommodation the animal is being moved to, and the animals it is to be mixed with, must not compromise the welfare of that individual or the other animals.

(See Appendix 4 – Animal Transactions)

6.4 Catching and transportation techniques must take account of the animal's temperament and escape behaviour in order to minimise injury, damage and distress.

6.5 Any animal taken outside the zoo must be in the personal possession of the operator of the zoo, or of competent persons acting on his/her behalf, and adequate provision must be made for its and the public's safety and well-being.

(See Appendices: 4 – Animal Transactions and; Appendix 7 – Training of Animals)

6.6 All animals taken outside the zoo must be kept securely at all times. Animals should be kept away from direct contact with persons other than the zoo operator or competent persons acting on his/her behalf, unless the zoo operator is satisfied that the animal is not likely, when under control, to suffer distress or cause injury or to transmit or contract disease. Zoo operators should exercise caution and discretion in the case of the removal of all animals from the zoo, since their behaviour may become less predictable when away from their usual enclosures.

7. Conservation, Education and Research

(See also Appendix 3 – Conservation, Education and Research)

PRINCIPLES

7.1 Although recognised as an important feature of UK zoos, conservation, education and research will become subject to legislative control in Britain when the EU Zoos Directive comes into force. The Directive will make it a formal requirement for the first time that zoos implement the following conservation measures:

a) participating in research from which conservation benefits accrue to the species, and/or training in relevant conservation skills, and/or the exchange of information relating to species conservation and/or, where appropriate, captive breeding, repopulation or reintroduction of species into the wild and;

b) promoting public education and awareness in relation to the conservation of biodiversity, particularly by providing information about the species exhibited and their natural habitats.

(See Appendix 1 – The EC Zoos Directive and Zoo Closures)

7.2 Zoos should establish ethical review processes or seek appropriate help in planning and implementing their conservation, education and research strategies.

(See Appendix 2 – Ethical Review Process)

CONSERVATION WITHIN AND BEYOND THE ZOO

7.3 Where the relevant species are held, a zoo must be an active participant in recognised species management programmes. The programme must contribute something beyond a basic interpretation of conservation in the wild.

7.4 Zoos should demonstrate measurable performance in conservation, education and research. Areas to be examined will include:

- overall conservation and education policy, and how this relates to the World Zoo Conservation Strategy;
- type and level of input into international conservation programmes;
- the educational role of the zoo as set out in any mission statement;
- whether there is a written education and research plan and how it applies to different sections of the zoos visitors.

EDUCATION

7.5 A zoo must have a written education strategy and an active education programme.

7.6 Suitable facilities should be available for education purposes.

7.7 Accurate information about the species exhibited must be available. This should include, as a minimum, the species name (both scientific and common), its natural habitat, some of its biological characteristics and details of its conservation status.

RESEARCH

7.8 Zoos should be able to demonstrate that they encourage research. Research can be developed through forging links with Higher Education Institutions. Full details of such projects should be available on request.

7.9 In any research carried out, care must be taken to comply with all relevant legislation and be subject to ethical review. Protocols, licenses (if held) and associated publications should be available at inspections.

8. Public Safety in the Zoo

PRINCIPLES

8.1 Section 5.(7) of the Zoo Licensing Act states ‘The authority shall not attach to a licence a condition which relates only or primarily to the health, safety or welfare of persons working in the zoo.’ These are dealt with under separate Health and Safety legislation.

8.2 Points regarding the containment of hazardous animals are particularly important to the animals’ welfare, as actions following escapes may result in the injury or death of the animal in order to guard public safety.

8.3 Risk assessments should be undertaken where appropriate and significant findings should be available for examination by the Inspector.

INSURANCE

8.4 Zoo operators must have insurance cover which covers them and every other person under a contract of service or acting on their behalf, against liability for any damage or injury which may be caused by any of the animals, whether inside or outside the zoo, including during transportation to other premises. Any upper limit on the sum insured must be set at an adequate but realistic level.

ENCLOSURES

8.5 Other than when under the control of authorised staff, animals kept in the zoo must be maintained at all times in enclosures or, in the case of free-running animals, within the perimeter of the zoo.

8.6 All animals should be kept in enclosures so constructed as to avoid escape. Gates and doors to enclosures must be securely locked so as to prevent unauthorised opening.

8.7 Barriers must be designed, constructed and maintained to contain animals within enclosures. Enclosures must be free from any vegetation or other items which would aid escape.

8.8 Gates and doors to enclosures must be at least as strong, and as effective in containing the animals, as the rest of the enclosure barriers. In particular, gates and doors should be designed and maintained so as to prevent animals from lifting them from their hinges or unfastening the securing device.

8.9 Gates and doors to animal enclosures where the public are admitted, and any enclosure or stand-off barrier, must be designed, constructed and maintained so as not to trap or otherwise injure visitors, particularly children or those with disabilities.

(See Appendix 6 – Animal Contact areas)

8.10 Animals which can climb or jump should be kept in enclosures secure enough to prevent them from escaping. Digging or burrowing hazardous animals must be kept in enclosures so constructed as to avoid escape underneath barriers.

8.11 Viewing panels used in enclosures should be able to withstand attacks by animals.

(See Appendix 8 – Specialist Exhibits)

8.12 Where fences are used to enclose animals, the supporting posts must be firmly fixed into the ground. Fence material should be sufficiently secured to supporting posts in such a way that the weight of the animal enclosed could not detach it from the support nor dislodge the supporting posts.

MANAGEMENT AND MAINTENANCE

8.13 Buildings, structures and areas to which the public have access must be maintained in safe condition.

8.14 The visiting public should not be allowed to enter any buildings or other areas of the zoo premises which could present an unreasonable risk to their health and safety.

(See Appendix 6 – Animal Contact Areas)

8.15 Areas where visitors are encouraged to go should have even, non-slip, surfaces, or be grassed, to avoid the risk, as far as is reasonably practicable, of visitors falling. Since grassed slopes may be slippery, consideration must be given to creating steps, paths or fitting rails.

8.16 Where a flight of steps is used as a means of access for visitors within the premises, a handrail should also be provided. Consideration should be given to providing shallow gradients for pushchairs and disabled access.

8.17 Trees within areas where visitors are likely to be walking or sitting should be regularly inspected and lopped or felled as appropriate to avoid visitors being harmed by falling branches. Similarly, vegetation such as nettles and thistles should be controlled to avoid injury to visitors.

8.18 Where a walkway passes over an animal enclosure it should be designed, constructed and maintained to ensure that it is safe. It should also be maintained, sited and protected so as to withstand contact by animals.

PROTECTION OF PUBLIC

8.19 Every person licensed to use a fire-arm must undergo training. Every trained operator should undergo periodic refresher training and practice. Such training should be recorded and available for inspection.

8.20 Fire-arms, ammunition and darting equipment, where provided, must be:

a) available for immediate use

b) used by licensed and trained operators only;

c) cleaned and maintained as recommended by the manufacturer;

d) kept securely under lock and key when not in use or under maintenance.

8.21 Appropriate staff must be trained in drug handling, risks, side effects, human risks if misused, and emergency protocols.

FREE-RANGING SPECIES

8.22 Section 14 of the Wildlife and Countryside Act 1981 prohibits the deliberate release or permitting to escape into the wild of non-indigenous species. This is particularly important if free-ranging species are kept in the zoo but not confined in enclosures.

8.23 The EC Zoos Directive requires that zoos are active in '…preventing the escape of animals in order to avoid possible ecological threats to indigenous species'.

8.24 Zoos must take into account the Wildlife and Countryside Act 1981 where there are free-flying psittacine birds or birds of prey in flying displays. Zoos must be aware of the legislation and take every precaution to prevent escapes. Particular points to note are:

- bird of prey centres who use birds in flying demonstrations should train birds sufficiently to ensure their return;
- where possible, transmitters should be used to help zoo staff to locate birds which have strayed.
- Zoos which allow psittacines to free-fly should encourage them to remain on site by providing roosting areas, nestboxes, and feeding points.
- Enough staff should be available to retrieve birds when lost.

(See Appendix 8.7 – Birds of Prey)

ESCAPES

8.25 The perimeter boundary, including access points, should be designed, constructed and maintained to discourage unauthorised entry and, so far as is reasonably practicable, as an aid to the confinement of all the animals within the zoo.

8.26 Zoos must have systems in place to minimise the risks of theft, malicious damage or release of animals by intruders entering the grounds out of hours.

8.27 Zoo operators must assess whether any danger may arise in the event of an animal escaping from its enclosure, and consider the possible or likely attempted escape route from the zoo if this were to happen.

8.28 Every effort must be made, so far as it is reasonably practicable, to effect the recovery, live or dead, of any escaped animals.

8.29 The procedures to be adopted in the event of escapes within or from the zoo (or of accidental or unauthorised releases) of any animal should be brought to the attention of, and available to, all members of staff in a written document.

8.30 Procedures relating to escapes of animals should be established and include the following:

- the reporting of every escape by the quickest possible means to the most senior member of staff available;
- the response to an escape in all situations; for example, whether daytime staff are on duty, whether visitors are present, and whether more than one animal has escaped;
- what needs to be done in the event of an escape; including recapturing the animal, protecting visitors, alerting the police.
- the control of visitors, including reassurance, ushering into buildings, closing doors and windows, evacuating the zoo;
- the security of the perimeter barrier, involving the closure of all points of access to, and exit from, the zoo;
- the provision of fire-arms and darting equipment to tranquillise or kill escaped animals, precise details of which to be discussed and agreed by the zoo operator and the local police;
- the provision of adequate equipment for members of any recapture party, including, where necessary, vehicle protection.

8.31 A member of staff should be readily available at all times to take decisions regarding euthanasia of escaped animals.

8.32 The zoo must establish a clear chain of responsibility, which must written and up to date. It must be notified to all staff, and posted on notice-boards in staff areas.

8.33 The zoo must be responsible for the selection of the appropriate fire-arm or darting equipment to deal with escaped animals.

8.34 Zoo operators must ensure that all members of staff are familiar with emergency procedures when animals escape. In particular, emergency drills must be carried out at least four times a year, recorded and regularly reviewed.

8.35 All escapes must be recorded and detailed reports made. Risk assessments must be continually reviewed in the light of experience. The standard licence condition 6 in Department of the Environment Circular 11/88 (Welsh Office14/88) requires notification to the local authority as soon as possible, and, in any case, not later than 24 hours following escape from the confines of the zoo of any non-domestic animal.

8.36 Zoos must consider the potential risks of releasing parasites, diseases or non-native plants and animals through effluent water and other routes. Waste water should be appropriately treated to ensure that this does not occur.

8.37 Where used to contain animals, moats (whether wet or dry) must be surrounded by fences, walls, hedges or shrubbery sufficient to prevent the public from approaching too close to the edge.

8.38 Barbed, razor wire or electrified fences should be beyond the reach of members of the public.

8.39 Stand off barriers must be provided and be designed, where necessary, to ensure public safety.

8.40 Safety barriers should be designed to prevent children either from getting through, under or over them. They should also be designed to discourage visitors sitting on them.

8.41 An adequate number of clearly visible safety signs, providing warning by means of a symbol, words, or a combination of symbol and words, should be displayed at each enclosure containing any species of hazardous animal which is likely to cause injury.

EXITS

8.42 Exits should be suitably located and adequately signed.

8.43 Each exit must be kept clear and be capable of being easily opened from inside to allow the release of visitors from the zoo. All such gates should be capable of being closed and secured to prevent the escape of animals.

SIGNS

8.44 Suitable and, where appropriate multi-lingual, warnings and information should be provided where animals and visitors may come into contact.

8.45 An adequate number of safety signs (in accordance with British Standard BS 5378 and, where appropriate, the Health and Safety (Safety Signs and Signals) Regulations 1996), giving warning of the hazard either by symbol or a combination of symbol and words, should be provided on any necessary electrified fence.

8.46 Warning should be given of all edges where a person might fall. Such edges must be guarded by a barrier capable of preventing children from falling.

8.47 Any buildings where a hazard exists should be kept locked. Warning notices should be displayed to indicate that access is either unsafe or not permitted.

8.48 Other areas should be clearly defined, e.g. by means of barriers and warning notices; or, where access is allowed to vehicles operated by zoo staff, by notices and road markings.

8.49 Zoos should consider the use of symbol-based signs wherever practicable to assist, for example, foreign visitors and children.

8.50 Safety signs on any electrified section of perimeter fence should face both outwards and inwards.

9. Stock Records

9.1 Records must be kept and maintained of all individually recognisable animals and groups of animals in the zoo. Where possible, animals should be individually identifiable.

9.2 The records must be kept either on a card index or computer, or other type of retrieval system from which information can be quickly examined.

9.3 Records must be kept up to date and be available on site for six years. Provision should be made for long-term archiving in a secure format.

9.4 The records must provide the following information:

a) identification and scientific name;

b) origin (i.e. whether wild or captive-born, including identification of parents, where known, and previous location/s, if any);

c) dates of entry into, and disposal from, the collection and to whom;

d) date, or estimated date, of birth or hatching;

e) sex (where known);

f) any distinctive markings, including tattoos, freeze-brands, rings or microchips;

g) clinical data, including details of and dates of any treatment given;

h) behavioural and life history data;

i) date of death and the result of any post-mortem examination and laboratory investigations;

j) where an escape has taken place, or damage or injury has been caused to, or by, an animal to persons or property, the reason for such escape, damage or injury must be recorded and a summary of remedial measures taken to prevent recurrence should be provided;

k) food and diets.

9.5 In addition to the individual records, an annual stocklist of all animals must be kept. A copy must be forwarded to the local authority no later than 1 April of the year following that to which it relates. The stocklist must include the following:

a) common and scientific names of the species;

b) total in the collection at 1 January;

c) number of arrivals into the collection from all sources during the year;

d) number of births or hatchings within the collection during the year;

e) number which died within 30 days of birth/hatching;

f) number which died at other times, including culls;

g) number that departed the collection, including sales, breeding loans, etc.;

h) total remaining in the collection at 31 December;

i) the sex of each animal, where known, must be recorded – e.g. 1.2.3 indicates one male, two females and three unsexed;

j) the records should be set out in columns for ease of compilation and reference, e.g.:

Common Name	Scientific Name	Group at 1.1.2000	Arrive	Born	Death within 30 days of birth	Death	Depart	Group at 31.12.2000
White-naped Crane	Grus vipio	2.1.1	0.2.1	0.0.2	0.0.1	1.0.0	0.1.0	1.2.3

10. Staff and Training

(See also Appendix 9 – Staff & Staff Training)

10.1 Number of staff and their experience and training must be sufficient to ensure compliance with the Standards at all times, taking due allowance for holidays, sickness and other absences.

10.2 A list must be maintained of all staff authorised to work with the animals, together with lines of responsibility and levels of expertise, training, and qualifications.

10.3 A suitably competent member of staff must always be available and in charge.

10.4 All animal staff must be competent for their individual responsibilities and given the opportunity to undergo formal training to achieve appropriate qualifications.

10.5 Continuous in-house staff training must be a regular aspect of the zoo.

10.6 The zoo operator must make every effort to ensure that his/her staff do not have any convictions under the Zoo Licensing Act 1981 or a background of the ill-treatment of animals under any other animal welfare or conservation legislation.

11. Public Facilities

FIRST-AID

11.1 First-aid equipment must be readily accessible on the premises.

11.2 First aid points must be adequately signed.

11.3 An adequate number of staff trained in first-aid must be available during the zoo's normal operating hours

11.4 Written instructions must be provided for staff in the provision of health care and the procedures to be followed in the event of an incident involving any venomous animal and a visitor or staff member.

11.5 These instructions must include immediate action to be taken and required information on a pre-prepared form for forwarding to the local hospital which would include:

- the nature of the bite or sting and the species inflicting it;
- the specification, for cross-reference purposes, of the anti-venom which accompanies the patient;
- the telephone number of the nearest poisons centre (usually London or Liverpool);
- the telephone number of the zoo and of an appropriate senior staff member;
- the telephone number of the appropriate specialist that must be contacted;
- where applicable, the medical records of the member of staff;
- details of the vet or any staff involved in handling venomous species.

(See Appendix 8.3 – Venomous species)

TOILETS

11.6 Adequate, properly equipped and maintained toilet facilities must be provided.

11.7 Clean water for washing must be provided along with soap and means of drying hands.

PARKING

11.8 Zoo operators must ensure, in liaison with the Local Authority and the police where necessary, that parking facilities are sufficient to meet the anticipated needs of visitors to the zoo.

PROVISIONS FOR PARTICULAR NEEDS

11.9 Suitable shelter and seats should be provided for use, in particular, by elderly people and parents with young children.

11.10 Arrangements should be made to meet the reasonable needs of special-needs visitors, including the disabled.

12. Display of Zoo Licence

12.1 The current Zoo Licensing Act licence or a copy of it, including the conditions must be displayed at each public entrance of the zoo.

APPENDIX 1

The EC Zoos Directive & Zoo Closures

1.1 Council Directive 1999/22/EC relating to the keeping of wild animals in zoos entered into force on 29 March 1999. The Directive provides for the licensing and inspection of zoos and for good standards of animal care, and sets the framework for the participation of zoos in conservation, research and education.

1.2 National legislation will need to be brought into line with the Directive by 9 April 2002. Pending implementation, advice is offered to zoos and inspectors on the requirements that will apply once the Directive is translated into domestic legislation.

1.3 The Directive will require of Member States to ensure that all zoos:

- 'participate in research from which conservation benefits accrue to the species, and/or training in relevant conservation skills, and/or the exchange of information relating to species conservation and/or, where appropriate, captive breeding, repopulation or reintroduction of species into the wild;'

- 'promote public education and awareness in relation to the conservation of biodiversity, particularly by providing information about the species exhibited and their natural habitats;'

- 'accommodate their animals under conditions which aim to satisfy the biological and conservation requirements of the individual species, inter alia, by providing species-specific enrichment of the enclosures; and maintaining a high standard of animal husbandry with a developed programme of preventive and curative veterinary care and nutrition;'

- 'prevent the escape of animals in order to avoid possible ecological threats to indigenous species and preventing intrusion of outside pests and vermin;'

- 'keep up-to-date records of the zoo's collection appropriate to the species recorded.'

1.4 Britain has had a zoo licensing system for two decades and with it an established system of licensing and inspection backed up by the Secretary of State's Standards of Modern Zoo Practice (made under section 9 of the Zoo Licensing Act 1981). Nevertheless, implementation of the Directive will involve some changes in the British legislation. A brief explanation of some of the significant differences is given below.

1.5 Since the 1981 Act had no conservation requirement, the new obligation for zoos to fulfil to participate in the conservation of biodiversity may be a departure for some. However, many zoos already have extensive programmes in this field.

1.6 As there are small differences in definitions in the Directive and the Zoo Licensing Act 1981, the Act will need to be amended. Major issues that will need to be addressed include references to 'live wild animals' and 'permanent' establishments in the Directive, and the limit of 6 days (one less than in the Act) on which a collection may be open to the public without requiring a licence.

1.7 The Directive refers to 'exemption' from its provisions that will not jeopardise the objectives of the Directive. This may necessitate a review of existing exemptions and may lead to a change in approach to dispensations.

Closure of Zoos

1.8 One significant addition to controls by the EC Zoos Directive is its provisions for the closure of a zoo. While revocation of a licence is provided for under the Zoo Licensing Act, the Directive adds potential flexibility by providing for partial closure in the case of breach of conditions, and for the closure of an unlicensed zoo.

1.9 The most significant innovation however, is that the licensing authority carries a responsibility for the animals if a zoo is closed. The provision is as follows:

'In the event of a zoo or part thereof being closed, the competent authority shall ensure that the animals concerned are treated or disposed of under conditions which the Member State deems appropriate and consistent with the purposes and provisions of this Directive.'

1.10 There are various ways of satisfying this requirement in relation to financial security, continuity and succession. One option is an industry led rescue package which minimises the financial burden by:

- relocating stock- many small zoos have a significant percentage of animals on loan. These could be returned;
- relocating genetically important stock through TAGS / EEPS
- in exceptional circumstances, euthanasia of stock that cannot be relocated.

APPENDIX 2

Ethical Review Process

2.1 There is an increasing tendency towards committees or groups of people serving as 'review' and 'audit' bodies on ethical issues. Zoos should be aware of the importance of ethics and have their own policy for dealing with ethical issues.

2.2 A large body of knowledge has been built up relating to ethics and review committees. Much of this stems from human medicine circles, where ethical review is a pre-requisite for most clinical studies, and the scientific research community, where ethical evaluation of projects involving animals is the norm. Establishments licensed under the Animals (Scientific Procedures) Act 1986 (ASPA) were required to have an ethical review process in place from 1 April 1999.

2.3 Zoos can benefit from independent assessment. In some cases there is merit in having a committee that looks at all ethical issues, both human and animals. These should include, for example, matters such as whether zoo staff should be required to be routinely vaccinated to prevent zoonotic transmission of contagious diseases, or to evaluate facilities for disabled people.

2.4 Zoos should have some form of ethical review process, particularly in situations where the use of animals (e.g. acquisition, management or disposal for conservation, education or research) may be in conflict with the best welfare interests of the animal or animals involved. Other issues that might be addressed include:

- In what circumstances an animal should be euthanased;
- whether waterfowl in enclosures should be pinioned;
- adequacy of procedures;
- transfer policy;
- culling policy;
- research projects;
- compliance with conservation and educational policies.

2.5 A large zoo should consider the establishment of its own ethics committee, but this may not be practicable for smaller establishments. They may instead opt for access to ethical advice from another committee or individuals. In some cases an ethics adviser may be appropriate.

2.6 Whatever choice is made, the following points are important:-

- the committee must not be perceived as merely an agent of the management: it should have independence and, at the very least, provide advice to the zoo operator;

- the committee should not consist only of scientists –although they may be able to advise on practicalities and research, they are not necessarily qualified to judge what is ethically acceptable.

- Where possible, junior staff from the zoo and members of the local community should be represented on the committee.

- the committee's work should be carried out in as open a way as possible, bearing in mind the need, on occasions, to respect confidentiality.

- the committee itself should be subject to review, with formal arrangements for changes to membership, rotation of chairman, and co-option of persons with particular skills.

2.7 The question of ethical review is one that is likely to confront zoos more and more frequently in the coming years. However, zoos of the future will be better able to justify their existence and the work they do if they have a system in place that permits their activities to be scrutinised independently and impartially.

APPENDIX 3

Conservation, Education and Research

3.1 Inspectors should assess conservation, educational and research standards and advise on performance against them.

Conservation

3.2 In accordance with the World Zoo Conservation Strategy, zoos have a responsibility to operate in a manner which uses the Earth's natural resources in a sustainable way. This can be achieved by increasing awareness of conservation, biodiversity and sustainable use issues. These will need to conform to the requirements of EC Zoos Directive when it is implemented.

3.3 While valuable contributions can be made by providing fund raising opportunities for organisations which are directly involved in conservation activities, in itself, this does not mean a zoo is meeting its conservation responsibilities. The contribution to conservation in the wild may be within Great Britain or overseas but it will not sufficient just to seek donations. There are a variety of ways of contributing, including:-

WITHIN BRITAIN

- providing habitat or aids to native species in the zoo (e.g. nestboxes for birds, vegetation mounds for grass snakes).
- by restricting the use of herbicides and insecticides.
- co-operating with other bodies in the establishment of reserves, the management of habitats (e.g. pond maintenance), and the approved translocation and protection of threatened animals or plants.
- encouraging environmentally responsible behaviour by visitors

OVERSEAS

- forging partnerships with foreign zoos and other bodies which are active in areas relevant to the conservation of indigenous wildlife. Assistance can be provided in terms of funding, advice, donation of materials, secondment of staff or offers of provision of training. Potential for involvement will vary with the size of the establishment but no matter how small, at the very minimum, all should consider participating in species management programmes.

Education

3.4 A modern zoo must contribute in as many ways as possible to the education of visitors. They can, for example, use graphics and other devices to provide information and raise awareness.

Inspectors should be familiar with the education standards expected in member zoos of the European Association of Zoos and Aquaria and the Federation of Zoos. Points to consider include:

- That zoo education is broader than in schools and should be targeted at all visitors.
- Educational material should, where possible, be linked to National Curricula.
- Methods of interpretation for visitors to the zoo should include signs, graphics, activities, interactive displays and demonstrations.
- Zoos should be encouraged to participate in zoo education networks.

Research

3.5 Modern zoos can, and often do, carry out research. Participating in research from which conservation benefits accrue is one of the options available to zoos to implement the conservation measures required by the EC Zoos Directive.

3.6 Research should be within the scope of any collection. This need constitute no more than collecting and collating information for statistical purposes. Record keeping should therefore be comprehensive and carried out in a systematic way. Where possible, zoos should use standard protocols for data collection to enable analysis. Data collection will usually be carried out by zoo staff, but there may be scope to involve volunteers, research workers or students. Data on specimens can be made available to outside projects.

3.7 Most zoo based research causes no harm to the animals involved, forms part of the routine management and requires no intervention with the animals in order to collect data. However, even apparently harmless research (eg dietary manipulation, blood sampling) requires careful thought and planning and should be subject to independent assessment.

(see Appendix 2 Ethical Review Process.)

3.8 The Animals (Scientific Procedures) Act 1986 (ASPA) specifies that a regulated procedure (ie one required to be carried out under licence), is 'any experimental or other scientific procedure… which may have the effect of causing the animal pain, suffering, distress or lasting harm'. The performance of such research requires licensing of the project and the person carrying out the work and is subject to periodic visits to the establishment by a Home Office Inspector.

3.9 Few zoos in the UK carry out research covered by the ASPA. But because the Act is very broad in its scope, zoos should be aware that even relatively harmless studies on animals might be subject to such controls. Visiting scientists need to be advised about the legislation before embarking on research work. If there is any doubt the zoo operator should consult the Home Office.

3.10 Research is of very limited value if the results are not made available to others, especially where they can help to influence the welfare, health or conservation of animals. Data needs, at the very least, to be readily available on request; preferably they should also be published.

APPENDIX 4

Animal Transactions

(see also Appendix 2 – Ethical Review Process)

4.1 The Animal Transaction Policy of the Federation of Zoological Gardens of Great Britain and Ireland should be complied with where appropriate.

Transport of Live Animals

4.2 Arrangements for transport must comply with the Welfare of Animals (Transport) Order 1997; the Convention on International Trade in Endangered Species of Flora and Fauna (CITES); and the Guidelines on Transport and the Regulations of the International Air Transport Association (IATA), and any other relevant regulations.

Animal Acquisition

4.3 In general, the acquisition of animals from the wild is to be discouraged unless there are justifiable reasons for doing so. If this option is necessary, an ethics and conservation policy should take into account:

- the legality of the acquisition;
- the need for so doing;
- the collection methods, including ensuring that they are environmentally acceptable and safeguard the welfare of the animal.

4.4 When receiving animals, collections should be capable of providing appropriate levels of husbandry based on the Five Principles.

Disposal of Live Animals

4.5 Surplus stock is any individual that a collection no longer wishes to house, for any reason. When disposing of such stock operators should ensure they are only passed to persons with the appropriate facilities, resources and expertise conforming with the Five Principles. Precautions should also be taken to ensure that recipients are likely to safeguard the animal's welfare in any subsequent transactions.

4.6 If animals bred in zoos are sold as pets to the general public, a licence is required from the local authority under the Pet Animals Act 1951.

Animals intended for release

4.7 The guidelines of the Reintroduction Specialist Group of the Species Survival Commission of the World Conservation Union (IUCN) should be followed when considering or undertaking the release of animals into the wild. Consideration should also be given to using other recognised guidelines such as those of the British Wildlife Rehabilitation Council.

4.8 Animals intended for release present special challenges in comparison with those staying in the zoo. For example, health care may need to be different and exposure to stressors may be necessary, as care and facilities in recipient country may fall below standard in the UK. Zoos involved in release programmes should make every effort to conform as closely as possible to the IUCN standards and reconcile these as far as possible with the legitimate needs of the project. Particular attention should be paid to the suitability of any temporary care facilities.

Euthanasia

4.9 Euthanasia is an acceptable procedure only if an animal cannot be provided with captive conditions which meet the Five Principles, or it cannot be released into the wild. Although breeding for conservation purposes is to be encouraged, species for which there is marginal or no conservation value should be carefully assessed on whether to allow them to breed, and, if not, appropriate action taken to prevent stock from increasing unnecessarily. In the main, measures should be taken to control unwanted or unnecessary breeding, are preferable to euthanasia of healthy stock.

4.10 Euthanasia may be justifiable under certain conditions, which include the following:

- If, in the opinion of a vet, an animal is suffering from an incurable disease, or severe pain or suffering which cannot be alleviated.
- If a zoo has to close, euthanasia may be the only option for some animals and the most humane for others.
- If the animal poses a serious and unavoidable threat to human safety (e.g. because it has escaped).
- Culling of surplus stock (including unacceptable sex ratios) where over-crowding compromises the welfare of the animals so that it is impractical to maintain them within the Five Principles.

4.11 It is important that a modern zoo has a policy, with appropriate protocols, to ensure humane and timely euthanasia to minimise suffering. This information should be made available to Inspectors and form part of the audit process. It should be capable of demonstrating that zoo operators have:

a) information and guidance from their veterinary surgeon on euthanasia, including emergency methods;

b) facilities for the humane despatch of animals of all the species kept, including for killing casualties under emergency conditions

c) support and advice on public relations aspects of the killing of animals.

APPENDIX 5

Veterinary Facilities

Veterinary services

5.1 When the Zoos Directive is implemented there will be an obligation upon zoos to have '….a developed programme of preventive and curative veterinary care and nutrition'.

5.2 In assessing the level of veterinary services needed, the over-riding factor must be animal health and welfare. The consulting veterinary surgeon will often be in the best position to assess the requirement, but it is important that operators have access to and make use of the best veterinary knowledge. Special-interest veterinary associations exist and may be able to provide help in locating specialist advice.

5.3 Continuing Professional Development (CPD) is now available, for example the Certificate and Diploma in Zoological Medicine, with specialisms in zoo and wildlife medicine, and in fish health and production. It is essential that zoo veterinarians make every effort to be up-to-date and to participate, when possible, in further formal training. It is also important that full advantage is taken of the availability of other specialists, such as those with expertise in veterinary dermatology, ophthalmology, cardiology, and human medicine.

5.4 In order to provide comprehensive veterinary care, a zoo may choose to use a local veterinary surgeon for basic cover, supported by a specialist. In both cases, adequate provision must be made for early contact and discussion when needed.

5.5 The level of veterinary service should be appropriate to the size and type of the collection. Over and above emergency calls, there should be sufficiently frequent regular advisory visits to assess general health and preventative veterinary practices. A minimum recommended frequency for different types of collections is as follows:-

a) Large zoos – weekly.

b) Medium sized zoos – 2 weekly.

c) Large bird parks – monthly.

d) Large aquaria, small bird parks – 2 monthly

e) Medium sized aquaria (especially with other animals), specialist reptile exhibits, small and mixed zoos – 3 monthly.

f) Small aquaria, butterfly houses, small parks aviaries, museum-type vivaria, small falconry centres – 6 monthly.

5.6 It may be feasible to extend an emergency visit into a regular visit provided that it occurs at an appropriate interval from the previous regular visit.

5.7 Definitions of the different type of zoos are difficult to arrive at, and it is at the inspector's discretion to decide into which category any particular zoo should fall.

On-site Facilities

5.8 Adequate facilities should be available at the zoo for routine or emergency examination of animals. Where these are basic, specialised clinical facilities should be available within a reasonable distance. There must be adherence to both legal standards and codes of practice relating to radiography, storage and use of drugs and firearms.

5.9 Where a full veterinary service is not available at the zoo, a dedicated treatment room should be provided at the premises and be available at all times for use for the routine examination of animals. There should be minimum facilities of an examination table, hot and cold running water, heating, ventilation, lighting and power. The room should be of sufficient size for the purpose, have washable floor and wall surfaces, and be maintained in a clean condition with adequate drainage.

5.10 Facilities should be available for the isolation and treatment of aquatic animals where these form part of the zoo collection. These should include separate holding tanks of appropriate dimensions to cope with the full range of species within the collection and the different water types (temperate, tropical, freshwater and seawater). Systems of catching up and moving sick fishes to the treatment facility should be in place, particularly for large fishes. Treatment tanks should be isolated from other water systems within the zoo or aquarium.

5.11 Facilities should be available for collecting, restraining, treating and, if necessary, for administering a general anaesthetic, for euthanasia and for the after-care of all species kept at the zoo. These should be made available to the veterinary surgeon within a period which minimises unnecessary suffering to sick animals.

5.12 Where a full-time resident veterinary service is located at the zoo, the facilities must be adequately equipped for the reasonable and foreseeable veterinary needs of the collection.

5.13 All animal drugs, vaccines and other veterinary products should be kept safely under lock and key with access by authorised persons only. Regular inspection by the veterinary surgeon to remove out-of-date drugs should be carried out. Full records of drug stock, usage and disposal should be kept.

5.14 Medicinal products should only be administered under the direction and control of a veterinary surgeon.

5.15 All unwanted or contaminated veterinary equipment must be disposed of safely. For example equipment should not be left in places where it could be reached by any animal and sharp instruments such as syringes and needles should be disposed of as specified in current legislation e.g. in rigid containers or incinerated after use.

Post-mortem Facilities

5.16 Normally animal carcasses should be quickly and safely removed to a professional veterinary laboratory. Where this is not possible, facilities should be provided for conducting post-mortem examinations and processing resulting samples in a safe and hygienic manner. If immediate post-mortem examinations are not possible, then in consultation with the veterinary surgeon, refrigerated facilities for storage need to be provided pending removal in a suitable insulated container to a post-mortem laboratory. Specimens should not be frozen unless specifically requested by the veterinary surgeon. In the case of animals which rapidly degenerate e.g. fish, where rapid diagnosis is essential, it is acceptable for post mortems to be carried out on site by suitably trained non-veterinary staff.

5.17 Facilities provided on the premises for post-mortem examinations should be suitably equipped for the species in the collection.

5.18 Following post-mortem examinations conducted on the zoo premises, carcasses and organs should be disposed of swiftly and in accordance with the Animals By-Products Order1999.

5.19 Whenever possible, carcasses of interesting animals or important species should be offered to a recognised scientific institution. Museums in particular will often welcome such material and make it available for study, thus extending the scientific and educational role of the specimen. Sometimes there is a conflict between the requirements of the museum and the need for a full post-mortem examination of the animal. In such cases a careful decision has to be made as to which takes priority. Post-mortem techniques that minimise damage to the carcass have been devised and can often be used in such circumstances.

5.20 Museums usually require skins but not soft tissue. Zoos should be aware of this and endeavour to retain soft tissue for pathological examination or deposit in a reference collection.

APPENDIX 6

Animal Contact Areas

Introduction

6.1 There are advantages and disadvantages in having animal contacts areas, both for the public and animals. The benefits include:

- the public may gain a better understanding and awareness of the species by being in closer contact and not having to view the animals in a conventional caged environment. As a result, the public's appreciation of the zoo and its educational value may be enhanced
- controlled handling of suitable animals can be an important learning experience eg. what does a snake feel like?
- the animals may be allowed into larger and more complex areas that would be possible in the more conventional cage/enclosure
- the presence of the public may prove an enriching experience for the animals

6.2 However, direct contact may present dangers to the public and cause stress or injury to the animals. The purpose of this appendix is to provide guidance so that the optimum environment and experience is encouraged, both for the animals and the public.

6.3 All situations where the public and animals are in direct physical contact should be subject to regular risk assessment before the activity commences, and review. Where the risk assessment indicates that controls are required to reduce the risk, then steps will need to be taken to tighten controls. (see the Health & Safety Executive Code Of Practice on Zoos).

General provisions

6.4 Zoo operators should exercise caution and discretion in the removal of even non-hazardous animals from enclosures, since the behaviour of all animals is less predictable when away from their usual environment.

6.5 All walk through exhibits, whether for hazardous or non-hazardous species, should have clearly delineated areas distinguishing public areas from those for the animals. There should be appropriate signs, supervision and barriers to ensure that the public do not enter the animal only areas.

6.6 Particular care should be taken to avoid injury to visitors when animals are used for rides.

6.7 Hazardous animals should not be allowed out of their usual enclosures for the purpose of direct contact with the public, except where the zoo operator is satisfied that such animals are not, when under control, likely to cause injury or transmit disease. This should be judged on a case-by-case basis once an adequate risk assessment has been carried out, and procedures developed to control risks to visitors and animals to an acceptable level.

6.8 Where hazardous animals are allowed out of their usual enclosures, or the public into their enclosures, an appropriate number of authorised and experienced members of staff must accompany the animal or animals.

(see Appendix 12 Dangerous Animal Categorisation)

6.9 The zoo must have adequate hand-washing and sanitising facilities, close to the contact point and obviously signposted. These should provide with running water, soap and disposable towels or hot air blowers.

6.10 Supervisors should ensure that, following contact with animals, children wash their hands. Prominent signs should remind parents or accompanying adults of this.

6.11 There must be adequate staff supervision in all contact areas. This should be commensurate with the type of animal and degree of risk, and to ensure the welfare of the animal. At all times whilst the public have access to the contact area there must be an appropriate number of staff on hand to ensure the welfare of the animals is not compromised by excessive handling.

6.12 If children are in contact with, or feeding animals, prominent signs must warn them not to place their faces against the animals, nor to put their hands in their own mouths afterwards.

6.13 Signs should be displayed prohibiting the public from taking any unauthorised food into animal-contact areas and warning of the risks of animal bites.

Walk-through exhibits

6.14 In walk-through exhibits with exotic herbivores/primates, the following points should be noted:

- Animals should be regularly and thoroughly screened for any zoonotic diseases, with particular reference to viruses in primates;
- Public entry should be controlled in groups;
- Number of group visits per day should be limited;
- When more than five people are admitted at one time, staff must ensure that the public are counted in and out;
- Staff to visitor ratios should be adequate. Staff members should carry an appropriate implement for possible defence of the public, and a radio linked to a control point.
- The public must be informed as to what is unacceptable behaviour;

- Where appropriate, facilities must be provided for secure storage of possessions;
- Feeding of animals by visitors should not be permitted, except where strictly controlled by staff;
- The public should not be eating or carrying food;
- Members of the public who may have eaten recently should be requested to wash their hands;
- Flash photography should be controlled;
- Trained first aiders should be available;
- Parties should be asked to consider any health problems they have which may be transmittable to the animals.

Diving experience exhibits

6.15 It has become commonplace for the larger public aquaria to allow sports and hobby divers to dive in shark tanks.

6.16 If this practice is permitted, it must be subject to the same provisions that are applied to other animal-contact situations and in particular to walk-through exhibits with hazardous species.

6.17 Encouragement should be given to read the guidelines being prepared by the Aquarium Divers Association once completed.

Touch-pools

6.18 Point to note on touch pool exhibits are:

a) Touch pools that permit direct-access should be continually supervised;

b) If supervision by a staff member is not continuous, the exhibit must be designed so that the depth and breadth of the exhibit make it impossible for the public to reach the animals, or there should be protection by a barrier or cover;

c) Animals used in touch-pools must be rotated throughout the day to allow animals a quiet period to minimise stress;

d) Staff must be properly trained in the handling and care of the species held and the management of visitors around the touch pool;

e) There must be continual assessment of the protocols used;

f) There must be an adequate educational contribution from the experience to justify it;

g) Specific records must be kept of animal use, illness and deaths.

h) Aquatic invertebrates should not normally be taken out of the water;

i) Removal of stings from rays to make them safe for display in open touch pool type exhibits should not be permitted.

Drive-through enclosures

6.19 Where dangerous animals are kept in drive-through enclosures, entry and exit to the enclosures should be through a system of double gates, with sufficient space between to allow the gates to be securely closed to the front and rear of any vehicle which may enter the enclosures.

6.20 In the case of dangerous carnivores, the access gates should be protected by fencing positioned at right angles to the perimeter fence on each side of the roadway within the enclosure, be of the same standard as that for the main enclosure barrier and extending back from the access for a distance of at least 25 metres.

6.21 Double gates should be designed and maintained so that, where hazardous animals are within or have access to the enclosure secured by the gates, one gate cannot be opened until the other has been securely closed. Provided no danger to the public is thereby caused, provision may be made for this arrangement to be overridden in the event of an emergency.

6.22 For other hazardous animals (except those grazing or hoofed animals where a cattle grid would be sufficient to contain them) single entry and exit gates, supervised at all times, should be provided.

6.23 Access points between enclosures should be controlled to prevent animals entering from adjoining enclosures.

6.24 Electronic pressure pads, where used, should be designed and installed to ensure that in the event of their failure, any gate they control will close automatically or otherwise operate to ensure that animals are safely secured within their enclosures.

6.25 Gates which are mechanically operated should have an alternative method of control so they can be opened and closed manually in the event of an interruption of the power supply or other emergency, or should be designed to close automatically when subject to power failure.

6.26 Operators of mechanically-operated gates should have a clear, unobstructed view of the gates under their control and of the area in the vicinity of those gates.

6.27 A one-way road system should be used to assist the traffic flow and thus reduce the risk of accidents. Stopping should only be permitted at places where the road is at two vehicles wide;

6.28 Where dangerous carnivores and primates and any other hazardous wild animal are kept:

a) Access to vehicles without a solid roof should be prohibited.

b) No vehicle should be allowed access unless a rescue vehicle capable of effecting its recovery is immediately available; and

c) Notices, which are readily visible and easy to read, should be displayed to warn visitors whilst in the enclosure to :

— stay in the vehicle at all times;

— keep all doors locked;

— keep windows and sun-roof closed;

— sound the horn or flash the headlights and await the arrival of a rescue vehicle if their vehicle breaks down.

6.29 Continuous observation by trained staff should be maintained over the entire area of each enclosure containing any hazardous animal. Staff working in emergency vehicles, gate control and observation towers and elsewhere within the enclosure should keep in touch by electronic means. A back-up system (using, where appropriate, whistles, horns or flags) should be rehearsed and be ready for situations when equipment is inoperative.

6.30 The supervising staff member should be armed with an appropriate firearm, and be trained in its use so that a hazardous animal can be killed in an emergency if this will save human life or injury. He or she should be authorised to act in the event of an emergency.

APPENDIX 7

Training of Animals

General Provision

7.1 There are three main reasons why animals are trained in zoos:

- To assist in their captive management, such as compliance with routine husbandry;
- To improve their welfare, for example, by training to facilitate routine veterinary procedures to be carried out without the need for an anaesthetic; and
- To participate in educational talks and demonstrations.

7.2 The objective of training must always be clearly defined in the context of:

- Animal welfare
- Keeper safety
- Public safety

7.3 All training programmes should provide a net welfare benefit to the animal.

7.4 Training methods should be based on positive reinforcement. Where negative reinforcement is used, it must never compromise the welfare of the animal. Written protocols should be established in zoological collections, which clarify approved, and where appropriate non-approved, training methods.

7.5 When animals are being trained there should be adequate facilities to separate them from groups to off-show, non-public areas.

7.6 Records must be kept and made available for inspection of all abnormal, unpredictable or otherwise significant behavioural irregularities for each animal at each training session and each demonstration.

7.7 Where public educational demonstrations are carried out, all trainers and the person responsible for exhibiting the demonstration must be registered under the Performing Animals (Regulation) Act 1925. This is not necessary if training procedures are limited to animal handling and veterinary tasks.

7.8 There must be adequate supervision of training and display by a senior member of staff with specific responsibility for doing so.

Use of animals in demonstrations outside the zoo

7.9 Section 22. (2) of the Zoo Licensing Act states 'For the purpose of the said Act an animal shall be…treated as kept in a zoo when it is elsewhere in the personal possession of the operator of the zoo, or of competent persons acting on his behalf.'

7.10 Although interpretation of the legislation is a matter for the Courts, it is generally held as exempting a zoo from the requirements of the Dangerous Wild Animals Act 1976 (and thus the need to apply for permission from local authorities to bring the animal into their area) when animals are taken, for example, to film studios.

7.11 Zoos must ensure that they have a certificate issued under Article 10 of Council Regulation (EC) No 338/97 for Annex A CITES specimens that are to be used or displayed commercially. However an Article 10 certificate is not required if a zoo has a separate certificate issued under Article 30 of Commission Regulation (EC) No 939/97. Article 30 certificates enables all zoo animals to be used or displayed commercially where they are being primarily used for breeding or research and educational purposes of benefit to the conservation of the species. A separate Article 10 certificate is required if the zoo intends to sell any Annex A specimens other than to a zoo issued with an Article 30 certificate.

7.12 Zoo operators who take animals to other locations for commercial or other purposes must make it clear to the other individuals or organisations concerned the circumstances under which the animals are provided and may be used. This must accord with the zoo's policy statement on such arrangements.

7.13 This policy statement should clearly set out that:

- The health and welfare of the animals will not be prejudiced;
- That accommodation is adequate for the species and commensurate with the time to be spent away from normal accommodation.

7.14 The user organisation should clearly understands that the designated member of the zoo's staff accompanying the animals (or such other person as the zoo may designate,) will have the absolute right to say for how long and for what purposes the animals may be used.

7.15 Whilst the comments regarding direct contact between public and animals made earlier may well apply, the operator should ensure that appropriate guidelines for the use of animals are followed. For example, the Animal Filming & Training Commission (AFTC) guidelines are well accepted within the industry and should serve as an acceptable Standard.

APPENDIX 8

Specialist Exhibits

8.1 The Zoo Licensing Act applies to all wild animals kept in zoos. These Standards therefore apply to species that may have very different environmental requirements.

8.2 Whilst basic rules apply to the management of all species – and the Five Freedoms are appropriate to all living animals – there is often a need for more specific guidelines when Inspectors are faced with less familiar animals.

8.3 The following guidance notes have therefore been drawn up. They should be read in conjunction with the appropriate management guidelines and other published data. At this stage only some specialist exhibits are covered; in the course of time there is likely to be further guidance.

8.4 Zoos and Inspectors are encouraged to make full use of the latest Taxon Advisory Group or Federation of Zoos Guidelines and other sources when assessing exhibits. Zoos and experts in many parts of the world are developing guidelines and these should be referred to.

(See Appendix 13 – Bibliography)

8.1 Invertebrates

8.1.1 While some collections contain only invertebrates, more often they form part of larger zoos. However, many of the Standards that can readily be applied, or adapted, to other collections are of limited relevance to invertebrates.

8.1.2 Invertebrates should be kept within their preferred body temperature (PBT) range or allowed access to a temperature gradient. Where doubt exists, a choice of habitats, with different temperatures and relative humidities (and where appropriate different substrates) should be available.

8.1.3 Contact with potentially toxic chemicals must be avoided. These include insecticides, disinfectants and heavy metals (which can prove lethal to molluscs).

8.1.4 Water quality is important to many invertebrates – not only those that are totally aquatic but also those that live or breed in damp places and/or require high levels of humidity.

8.1.5 Although, as with other species, hygiene is important, care has to be taken to consider the requirements of different species. Where this knowledge is not available within the collection, specialist advice may need to be sought.

8.1.6 Health screening should be carried out upon arrival of new invertebrates into the collection, particularly for wild-caught stock. A quarantine area and/or isolation facilities are desirable.

8.1.7 Veterinary guidance on invertebrates is developing apace. Methods of treating individual animals, especially arthropods, and diagnostic tests and disease prevention measures for colony animals are more effective than previously. Personnel responsible for invertebrate collections should, therefore, view veterinary assistance as important in keeping animals healthy. Not all veterinary surgeons are knowledgeable about invertebrates, however; specialised advice may be required.

8.1.8 The 'Notes for Inspectors' produced by the Federation of Zoos should be available to operators of invertebrate collections. In addition to aiding inspections, these provide useful information about the care of these diverse animals.

8.2 Reptiles and Amphibians

8.2.1 Under prevailing climatic conditions in Britain, most species of non-native reptiles and amphibians require a controlled environment for survival in captivity. Some of these environments may require water. Animals may be kept in fully controlled vivaria, or in open enclosures inside a larger controlled climate space. Some species may be comfortable outdoors during periods of good weather. Controlled environments must provide all of the animal's needs for heat, humidity, light and photoperiod, air and water quality. Because of high environmental temperatures, attention to hygiene and disease control are especially important.

TEMPERATURE

8.2.2 Vivaria must provide a thermal gradient around the preferred body temperature of the species of animal kept. Natural daily and seasonal variations should be provided. Heat sources must be designed and fitted to prevent injury to the animal. Sources must be thermostatically controlled or regularly adjusted in response to a clearly visible monitoring system (thermometer, thermocouple etc.). Installation of a constant readout system is encouraged, so that fluctuations can be recognised retrospectively.

8.2.3 For more tolerant animals, such as crocodilians, open enclosures in heated rooms are sufficient, provided the temperature can be monitored at the animal's level. Safe local sources of more intense heat (heat pads, basking lamps) should be provided where appropriate for the species. Pools may need to be heated separately. The requirements for most reptiles are within the range 20-35°C however, most tortoises and crocodilians need water temperatures in the range 26-32°C.

HUMIDITY

8.2.4 Relative humidity (RH) is a function of temperature, moisture content of the air and ventilation. As temperature and moisture in the exhibit are usually fixed, control of humidity through altering ventilation is preferred, and should be possible. Hide structures can be used to provide local humid areas. Measurement of relative humidity should be continuous if possible, but daily readings are acceptable. RH range for most reptiles varies from 50-80% depending on the natural habitat of the species. The majority of amphibians require a higher range, typically 65-95%. Many features of the exhibit may affect the RH, including pools, spraying and the presence of plants.

LIGHTING

8.2.5 Lighting should be appropriate in strength, photoperiod and type for the species held. Ultraviolet (UV) light from full spectrum sources is essential for many species when not available naturally. Most glazing materials do not transmit natural UV light. UV light sources have a limited life and must be replaced regularly, and records kept. Generally, the local photoperiod should be followed, unless there are specific species requirements, for example, breeding.

AIR QUALITY

8.2.6 There should be sufficient ventilation to maintain air quality and RH in the exhibit without compromising temperature control. This is facilitated by keeping vivaria within suitably ventilated warm rooms.

WATER QUALITY

8.2.7 Pools large enough for full immersion are required by many reptiles and amphibians, and for reproduction in many species of amphibians. Water quality is normally maintained in smaller pools by regular replacement of the water and cleaning of the pool surface. Attention should be given to sudden temperature change and the risk of introducing toxic disinfectant residues during this procedure. Larger pools for semi or fully aquatic species should have water treatment facilities and quality should be monitored on a regular basis, as for aquaria. Fully aquatic species need sufficient space for comfortable swimming and to allow sufficient exercise. Beaching areas should be provided where appropriate. Transmission of pathogens between exhibits via communal water systems and tools is a major risk, and should be avoided.

FURNITURE AND SUBSTRATES

8.2.8 For normal display purposes, naturalistic exhibits should be used with substrates appropriate to the natural habitat of the species. As confinement increases pressure on substrates, they should be changed regularly and not allowed to become contaminated. Waste and uneaten food should be removed daily. Basking and concealment sites and rough surfaces to aid sloughing should be provided. Climbing material should be provided for arboreal species. Where animals are kept outdoors, care should be taken to avoid the risk of flooding or of animals burrowing or climbing out. More natural planting and substrates are possible. Predator and pest control are particularly important under these circumstances.

SPACE REQUIREMENTS

8.2.9 General comments about the space needs of all animals apply to reptiles and amphibians. However, it must be remembered that many reptiles grow quickly in early life and often continuously thereafter, and so frequently outgrow their enclosures. If enclosures are not large enough to accommodate the future growth of the species exhibited, there must be a clear plan for its future accommodation.

SERVICE AREAS

8.2.10 Service passages should be large enough for comfortable working and handling of the animals. Access to enclosures should not be so awkward as to restrict observation or cleaning. Service areas must be kept free of clutter particularly where venomous species are held (see Appendix 9.3). Handling and catching equipment should be readily available close to enclosures, and there should be handwashing facilities for staff.

FEEDING

8.2.11 Live feeding of vertebrate prey is to be discouraged (see Standard 6). Where it has to be undertaken, feeding must be observed and live prey not left in the enclosure. Balanced diets which meet all the nutritional needs are essential, as for all species, and vitamin and/or mineral supplements are also often necessary. Provision of drinking water may not be straightforward in some species. Cloud and rainforest reptiles may only drink from droplets on vegetation and desert species may lick surface condensation. Dechlorination of drinking water may improve palatability.

RECORDS

8.2.12 Records must be kept of all individual animals. In addition to the normal information, these need to cover environmental parameters, feeding, sloughing and egg-laying.

8.3 Venomous Species

8.3.1 Zoos keeping venomous species of reptile, amphibian, fish or invertebrates must ensure that sufficient trained staff for management are available at all times.

8.3.2 Venomous animals should be kept in walled enclosures (with suitable means of ventilation) or in enclosures where the walls are of adequate height and design to prevent non-flying animals from escaping.

8.3.3 Service areas for non-aquatic venomous species should be secure with the equivalent of a lock-gate system. Service areas should be free of routes of escape, for example into cavity walls.

8.3.4 Tanks or vivaria containing venomous species should be individually marked with warning signs in the service area. Vivaria must be kept individually locked and access available only to authorised persons.

8.3.5 Appropriate staff training must be given, and a written protocol made available on action to be taken in the case of escape or bites. Regular practices must be carried out and recorded, and audits of protocols conducted.

8.3.6 The appropriate up-to-date anti-venom must be held either at the zoo, and should accompany a bitten or stung patient to hospital; or be held at the appropriate hospital. It must be kept in strict accordance with the manufacturer's instructions. The location of anti-venom and hospitals should be decided on the basis of specialist medical advice and recorded in a written risk assessment.

8.3.7 Local medical authorities should be made aware in advance of any zoo keeping venomous species. This should be regularly updated by the zoo concerned. The appropriate medical authorities should be consulted and made aware of the procedure to be followed by the zoo in the event of incidents involving venomous bites and stings. A list of specialist help and contact details must be available and readily accessible in case of an emergency.

(see appendix 14 – Dangerous Animals Document)

8.4 Pinnipeds and marine birds

8.4.1 As with other aquatic species, there can be difficulties in inspecting facilities for marine mammals and birds. These guidelines are intended to assist inspectors with limited marine mammal experience. Further reference may be made to the UK Marine Mammal TAG Pinniped Husbandry Guidelines (Federation of Zoos, in prep.) and the Penguin Husbandry Manual (American Zoo and Aquarium Association, 1994).

ACCOMMODATION SPACE

8.4.2 Attention should be given to the adequate provision of both land and water space. In general more active species, such as sealions, need more land space, but all groups are primarily aquatic and should be provided with the maximum possible water space. No specific provisions are needed for breeding, with the exception of nest holes for some penguins and ledges for seabirds, but the risk of drowning in young pinniped pups, particularly sealions and fur seals (which cannot swim at birth), must be noted. Male pinnipeds tend to harass females after birth, and provision for separate accommodation for mother and pup is needed. The design of land space should avoid the loss of penguin eggs by immersion.

CONSTRUCTION

8.4.3 Sea bird droppings are particularly destructive and surfaces need to be highly resistant. All land areas should be designed to allow water and waste run off to drain without contaminating the pool, as far as practicable. Pool and land surfaces should have a durable, non-toxic, non-porous and waterproof finish, and should be coloured to reduce glare. In the case of pinnipeds, pool walls should be smooth to prevent injury. Land surfaces with sand, pebbles or vegetation are acceptable, provided cleansing and drainage are to an acceptable standard.

TEMPERATURE, LIGHT AND VENTILATION

8.4.4 Environmental temperatures should be appropriate for the species. Most species of marine mammals and seabirds can be comfortably kept in the UK, so long as shade is provided for exceptionally harsh or hot weather. Antarctic ice-dwelling penguin species need year-round cooling and require specialised closed environment exhibits with low temperatures, filtered air and high ventilation rates. High reflective light levels in pinniped exhibitions should be avoided because of the risk of eye discomfort and disease.

WATER MANAGEMENT

8.4.5 The aim of water management is to provide a safe and appropriate environment for the species, bearing in mind that the particular requirements for closed systems differ greatly from open water. Marine species produce large amounts of highly nitrogenous waste, which reacts with chemicals to produce noxious byproducts and acts as an ideal substrate for microorganisms.

8.4.6 Marine species are adapted to salt water and the provision of a salt water environment is beneficial. Baikal seals are adapted to fresh water.

8.4.7 Operators should set written parameters for water quality using published guidelines and should make sufficient measurements and keep records to show that these are consistently met. Any chemicals used in this process should be capable of being readily measured in water and should be non-toxic and non-irritant at concentrations applied. The safety of incoming water, where this is not from a mains source, should be regularly checked. If on-line monitoring of water parameters (such as salinity, pH, chlorine and temperature) are not incorporated in the system, measurements should, as a guide, be taken at the following frequencies: –

temperature	daily
salinity	daily
chlorine etc	2 – 4 times daily
pH	2 – 4 times daily
ozone/redox	continuous
bacteria	monthly

8.4.8 The inspectors should thoroughly investigate the training and level of understanding of water systems and their monitoring by zoo staff.

8.4.9 There should be clear precautions and instructions for protecting the animals, staff and the public in the event of fire. These may include electrical/water hazards, chemical leakage or overdosage, plant failure, fire and water loss. Such precautions will generally include the facility to drain pools quickly, provide separate temporary accommodation for animals, and evacuation plans. Where separate pools are available for quarantine purposes, they must include a separate water system.

8.4.10 The method of disposal of waste water from closed or fill-and-empty systems should be regularly examined as to environmental and public safety.

NUTRITION AND VETERINARY CARE

8.4.11 Preparation and storage of food and the use of appropriate supplements to counteract nutritional inadequacy are particularly important in piscivorous species. If animals are scatter fed, the risks from deteriorating fish must be considered and uneaten food removed. Salt supplementation may be required if fresh water is used in pools. There should be adequate facilities for handling the animals safely should the need arise. This may involve training and use of physical restraint devices. The restraint and anaesthetic requirements for marine mammals differ substantially from those for terrestrial species. Preventive treatment against avian malaria is required for outdoor penguins in the summer.

PUBLIC SAFETY

8.4.12 Marine mammals and penguins bite. All of them can reach much farther than it appears, and penguins, sealions and fur seals can climb and also leap from water. Barriers around pools and land areas should take this into account. Where visitor contact is possible with penguins outside their enclosures, there must be adequate staff supervision.

(See appendix 13 Dangerous Animals Document)

8.5 Public Aquaria

WATER QUALITY

8.5.1 Although water quality requirements of different species vary it is important that certain basic parameters are monitored and recorded, and that due care is taken to cater for particular species requirements.

8.5.2 Water quality monitoring should be carried out as routine:

for new exhibits or ones that have undergone major servicing, daily monitoring should include temperature, salinity (as ppt or as SG in salt water tanks), pH, total ammonia (to assess un-ionized ammonia), and nitrite; and, on a weekly basis, periodically dissolved oxygen and nitrate.

after a one month period, if a tank is stable, tests can be carried out weekly rather than daily

at all times, there must be provision of sufficient water treatment equipment to ensure the maintenance of water quality within set parameters to meet species specific requirements.

8.5.3 Public aquaria should use professional standard water quality test kits. There should be some quality control of test procedures, either by parallel sampling or calibration against set standards.

8.5.4 Aquarists should have access to on-site laboratory facilities, such as basic microscopy, and be trained in sample collection.

8.5.5 Specific water quality tolerances and requirements vary considerably, but typical maintenance ranges for water in the tank would be:

	Marine	Freshwater
NH3	<0.05 ppm	<0.1ppm
Carbonate hardness	6500 mg/L most	<200 mg/L
Nitrite	<0.1 ppm	
Nitrate	<20 ppm	
O2	>6 mg/L	>6 mg/L
PH	7.9-8.4	6.5-9
Redox	340+/-20 mV	
Salinity	27.5-32 ppt	5-9 sometimes used in therapy
Specific gravity	1.022-1.025	
Temperature – temperate	<15 ºC	<15ºC
– tropical	23-26ºC	23-26 ºC

VETERINARY SURGEON

8.5.6 The veterinary surgeon should be familiar with current practice regarding veterinary care of fish, especially the species with which he or she is expected to deal. He or she should be responsible for, or actively involved in, the following:

- routine visits; (see appendix 5 – Veterinary Facilities)
- staff training in disease recognition and basic lab techniques;
- directing or carrying out treatment of sick animals;
- preparing a set of treatment protocols for aquarium tanks.

DIVERS

8.5.7 Aquarium divers must operate to current HSE Approved Codes of Practice. Divers must also receive training about the behaviour and requirements of the species with which they are diving.

8.5.8 Feeding techniques vary; for example, some institutions favour stick-feeding of sharks, but hand-feeding may be acceptable if risk assessments have been carried out and insurers agree.

8.6 Waterfowl

8.6.1 Most non-domestic waterfowl are given the freedom of a pen and not contained overnight. Exclusion of predators such as foxes, cats and smaller mammals is an important part of waterfowl management. This will include use of predator-proof fencing (essential to exclude foxes), electric fencing, trapping and shooting. Care should be taken in selecting species for open-topped enclosures.

8.6.2 Wild waterfowl that visit the collection can present dangers in the form of disease or contamination of water supplies. Allowance has to be made for this when planning enclosures or setting stocking densities.

8.6.3 Pens for waterfowl must be carefully designed and smaller areas may need to be at least 50% water. Less water is acceptable for geese which graze. Birds must be able to enter and leave the water without difficulty: therefore, edges should be sloping with a gradient of one in three or less. Perimeter fences should be 2 metres high (preferably 3m) and buried to approximately 0.5m. A pulsed electric fence to deter predators is essential if the fence is less than 2m high.

8.6.4 Water is essential for most species if they are to perform their normal behavioural repertoires. Water may be static but systems that allow for inflow/outflow are to be preferred, so long as they do not encourage the spread of pathogenic organisms from one pen to another. Water quality is important; areas for waterfowl need careful planning. Vegetation provides shelter, protection and shade and can protect birds from chilling and frostbite. Tropical species may require indoor, sometimes heated, accommodation.

8.6.5 Areas of grass may be essential for some species, e.g. Branta and Anser geese, swans, shelducks, sheldgeese and grazing ducks (widgeon species, Falcated Teal, Baikal Teal). When grass is in short supply supplementary feeding with pellets may be necessary. Waterfowl vary in their dietary requirements but a mixture of layers pellets (the smaller size for smaller ducks) and wheat provides an acceptable supplement – or primary source of nutrients for most of the less specialised species.

8.6.6 Mixing of species has to be considered very carefully. Some waterfowl are aggressive or territorial and best kept apart. Others are sociable and will live together as a group, but care is needed to ensure an appropriate sex ratio. Very careful thought is needed before mixing waterfowl with other species of animal, such as mammals; deer, antelope and other ungulates can damage waterfowl, or be a source of long-term stressors. Exclusion fencing, fixed 30 cm above the ground, may allow waterfowl to escape from interference.

8.6.7 Pinioning of birds is legal in the UK (so long as they are not on agricultural land) but should not be undertaken lightly. Collections should have an ethical policy and code of practice regarding pinioning and be prepared to defend it. (see Appendix 2 – Ethical Review Process)

8.6.8 Other points particular to waterfowl include:

- the availability of nestboxes;
- incubation, brooding and facilities for grain storage;
- provision of grit (soluble and insoluble).

8.6.9 Breeding facilities for waterfowl may, depending on the species, include nestboxes and nesting material). Nestbox design is all-important: the size and position of the opening can make a great deal of difference to breeding success. Hybridisation should be avoided by not mixing similar species in the same pen.

8.6.10 There are human health and safety considerations in the keeping of waterfowl. Ponds can be a source of infectious organisms. Electric fences must be positioned such that the public can not come into contact with them and pond edges must be fenced where necessary.

8.6.11 Advice on the keeping of waterfowl is available from a number of organisations including the British Waterfowl Association and the Wildfowl and Wetlands Trust.

8.7 Birds of Prey

8.7.1 Birds of Prey (Falconiformes and Strigiformes) are kept in a variety of ways and for a variety of reasons, These include:

- Aviaries, where birds enjoy relative freedom of movement, and are kept for display and or captive breeding.
- Demonstration birds, tethered or not, that are free flown regularly for the general public.
- Homing of the occasional permanently disabled wild bird, for educational or captive breeding purposes.
- Sick or injured wild birds, kept for treatment and rehabilitation.

8.7.2 Each of these categories of keeping brings with it particular requirements in terms of good management. Some of these are outlined below: other relevant information is to be found in various codes of practice and publications, details of which are listed in Appendix 14.

AVIARIES

8.7.3 Birds of prey kept in aviaries are generally managed in a similar way to other birds. Particular points to note are:

- Choice of species. Some species, such as accipiters, are by temperament less well suited to zoos. Their nature makes them very difficult to house and manage and they should only be kept in specialist collections.
- Food. Whole animal diets are needed, or meat that has been properly supplemented. No food type should be used exclusively. All birds of prey must have access to clean drinking and bathing water daily.
- Aviary design. Enclosures should provide suitable vantage points for the species, as many raptors prefer to be up high. Perching should be appropriate for the species housed. Sizes should reflect the flying capabilities of the species. For example large vultures are unable to land lightly and so need enough space to land without causing injury. Most birds of prey are more settled in pens with at least one solid wall. Retreats may be necessary for more nervous individuals.
- Mixing genera is rarely a good idea, and if done, should be managed with extreme care. Knowledge of the individual birds and experience in dealing with birds of prey in general is essential.

DEMONSTRATION BIRDS

8.7.4 Tethering. Birds of prey kept as demonstration birds are subject to restraint by tethering for part of their lives, so that they can be free-flown for the public. Important considerations are:

- Flying. Birds that are tethered must be flown at least four times a week unless tethered for medical treatment. No bird should be tethered permanently. All birds should be given the opportunity to fly or move around freely during part of the year.

- Rest and Moulting. All collections should allow sufficient aviary space to rest working birds and allow them to moult.

- Birds not be tethered. Owls and vultures, particularly the New World vultures should not be kept tethered. They can easily be trained to fly from pens and this is the preferred way to house them.

- Safety at Night. Tethered birds are very vulnerable to attack by other wild animals, so they should be well protected at night. Birds that are put away at night should be placed in areas that meet appropriate welfare standards under section 8 of the Wildlife & Countryside Act 1981and should not be left shut in for unreasonably long periods. Unless ill, owls in particular should not be shut away in boxes at night.

- Flying Areas. Flying areas should be free of hazards for birds and should not be close to cages containing animals that might catch or kill a bird should it alight on or in the cage. Taking birds to and from the demonstration area should be made as safe and stress free as possible by travelling in a suitable vehicle. Flying areas should not be directly adjacent to, or in view of tethered birds.

- Staffing. Staff should be well versed in training methods, weight reduction issues, handling techniques, and maintenance of equipment and birds. They should also be capable of passing on the correct and up to date information about the birds to the watching public.

- Escape. Birds that are free-flown are always at risk of being lost. If not found, most demonstration birds will eventually die. Such incidents can be reduced by good training, experienced handlers and by ensuring that all birds being flown wear telemetry for radio tracking.

DISABLED WILD BIRDS

8.7.5 Permanently injured wild birds of prey will sometimes come into a collection and can be useful either as an educational bird, or, with the rarer species, as a part of a captive-breeding program.

- Individual needs. The welfare and quality of life of these birds should be paramount. Badly injured birds, however rare, which are not capable of living a reasonable life should be euthanased. Birds which are too nervous to be displayed in public should not be kept on public display. Permanently disabled birds should not be tethered.

- Housing. Often these birds are either unable to fly and or land properly. Perching should reflect the ability of the bird in question.

- Pairing. When paired with non-injured birds, aggression levels will need to be monitored, as injured bird will be less able to cope.

NB There are other legal requirements specific to many native species which should be adhered to.

SICK OR INJURED WILD BIRDS

8.7.6 Sick or injured wild birds should not, in theory, form an integral part of any zoo or collection. However, given the definition of a zoo under the Zoo Licensing Act, some establishments which tend casualties and have more than 7 public open days a year will be subject to the licensing requirements of the Act and liable to inspections. Some particular points relating to such collections are:

- Disease Control. Sick or injured birds are more prone to disease than healthy animals. Health monitoring and hygiene needs therefore need to be rigorous, in order to minimise risks to other birds, staff and visitors.

- Welfare. Most of the birds will have come in from the wild and will already be stressed. Exposure to the public will exacerbate this. It is therefore strongly recommended that save in exceptional circumstances, recovering wild birds should not be displayed to the general public.

- Accommodation. Facilities must cater for injured birds' special needs. Birds destined for release may need to be kept under conditions where they can retain their escape behaviour, gain confidence and fitness in flight and behave naturally.

8.7.7 The requirements for owls (nocturnal birds of prey) closely mirror those described above, with some differences. The Owl TAG has produced its own guidelines and these should be used for reference.

8.7.8 Some birds of prey in zoos may be subject to control under several different pieces of legislation, for example the Wildlife and Countryside Act 1981 and CITES. Legislation concerning welfare, animal health, travel, and veterinary treatment may be relevant. It is important for operators to understand which legislation applies to zoos.

APPENDIX 9

Staff & Staff Training

Training

9.1 Continuous in-house staff training and development (eg Investors in People) should be a standard feature of the zoo. Typical topics include:

- animal husbandry;
- animal welfare;
- health and safety and first aid;
- action in emergencies, escape, illness;
- safety procedures;
- emergency euthanasia;
- basic sampling for health monitoring and diagnosis;
- food hygiene;
- diseases especially emerging ones such as Bovine Spongiform Encephalopathy (BSE), Salmonella Enteritidis, Escerichia coli 157, Hantaan virus;
- diving hazards;
- management of species used in animal-contact areas;
- in situ and ex situ conservation;

Staff

9.2 The zoo operator must make every effort to ensure that his/her staff do not have any convictions under the Zoo Licensing Act 1981 or a background of the ill-treatment of animals under any animal welfare or conservation legislation including:

- the Protection of Animals Acts 1911 to 1964;
- the Protection of Animals (Scotland) Acts 1912 to 1964;
- the Pet Animals Act 1951;
- the Protection of Birds Acts 1954 to 1967;

- the Animal Boarding Establishments Act 1963;
- the Riding Establishments Act 1964 and 1970;
- the Breeding of Dogs Act 1973;
- the Dangerous Wild Animals Act 1976;
- the Endangered Species (Import and Export) Act 1976;
- the Wildlife and Countryside Act 1981;
- the Control of Trade in Endangered Species (Enforcement) regulations 1997.

APPENDIX 10

Zoo Licensing Act 1981

Pre-Inspection Audit

Date

Although completion of this form is not obligatory, doing so will save time at the inspection and help keep down fees.

In addition to the documents you are requested to attach, you may be required to produce evidence to support any one of the answers on this form.

DETAILS OF INSTITUTION
Name and Address of Institution Telephone Numbers Fax e-mail Website Name of Director
Short history Year of founding Parent Institution (if any) Source(s) of funding eg visitors, local authority etc Type of Business (eg Partnership, Registered Charity) Ownership of organisation/grounds Governing body Chairman of Governing body
Do you have a master plan/business plan? If so please enclose a copy
Mission statement
List of staff members and their titles and qualifications. Attach (State if full or part-time) Submit a copy of the organisation's organisational chart Attach
Plan of park/zoo Attach
Hours of operation Summer Winter Entrance Fees and Categories Attendance Figures for past three years
Does your institution own or operate another zoological park or off-premises breeding facility or other animal holding facilities?

DETAILS OF INSTITUTION *continued*	
If yes, please give details	
Please supply your most recent Animal Inventory List	Attach
Is your institution a member of ISIS?	
If YES Do you use ARKS? SPARKS? REGASP? MEDARKS? Other computer databases?	
Records What arrangements are made for holding current animal records? Does your institution keep duplicates of animal records? If so where are they stored? How are old records archived? Are they readily accessible to *bona fide* enquirers? Please list which methods of animal markings your institution uses and taxa used for: Transponder Tattoo Ear tags Rings Other	
Are daybooks kept to record condition and health of all animals? Please summarise the reporting structure.	
What is your contingency plan for the animals in the event of closure or loss of income for a sustained period of time?	
Zoo Operations Under what circumstances, if any, do you feed live vertebrate?	
Is feeding of animals by visitors permitted? How is this controlled?	
Is expert advice sought and taken regarding nutrition? If so from whom and where?	
What is the smoking policy for zoo staff?	

DETAILS OF INSTITUTION *continued*	
Animal Husbandry and Veterinary Care Who is your veterinary surgeon? If none, who is your veterinary officer/adviser? Are others involved in giving specialist animal health advice to the collection? If so give details Describe your veterinary programme, including frequency of visits and the sort of work normally performed.	
Briefly describe the veterinary facilities that you have on site.	
Do any of your vets take part in relevant Continuing Professional Development? If so, please give details.	
Does your institution undertake routine examination of animals including parasite checks and a programme of preventive medicine, including vaccinations?	Please attach a summary of the examination
Please give details of equipment and drugs for restraint;	
What arrangements are made for *post-mortem* examination of animals?	
What system do you have for regular review for clinical and pathlogical records?	
Do you keep up-dated records of animal diets?	
How do you collaborate with other zoos and other organisations in the exchange of husbandry information for the species that you keep. If so, please provide details.	

DETAILS OF INSTITUTION *continued*	
Health and Safety	
What risk assessments are routinely carried out:	
Feeding practices	
Staff-animal interactions	
Venomous species	
Animal-contact situations	
Escapes/release of animals	
Visitor areas (slopes, steps etc)	
Staff use of equipment	
Others	
Does the zoo have an accident book? Please provide a copy of your written emergency procedures. How are staff members made aware of all emergency procedures? Please provide the written reports of emergency drills for the past 12 months	 Attach Attach
Are staff trained to handle other emergencies?	
How are all staff made aware of potentially zoonotic disease risks?	
Is an accident-reporting procedure in operation (RIDDOR)?	
Is zoo health and safety policy written and understood by all staff and volunteers?	
Is the escape procedure written and available to all staff?	
Is a qualified tree surgeon retained to inspect and attend to trees which may cause injury or aid escape.	
Give details of the vermin and predator control programme.	
Is there a procedure for reporting staff illness?	
Is there a procedure for reporting maintenance needs?	
How often are enclosures, fences and stand-off barrierts checked for damage and maintained	
How often are electrical systems and equipment checked and maintained?	

DETAILS OF INSTITUTION *continued*	
Are there procedures in place to ensure that any defects identified by checks are remedied?	
Security	
How is the collection protected on a 24-hour basis	
Please give details of firearms (including capture equipment and captive bolt guns) and access to them	
Is the use of firearms practised and recorded?	
CONSERVATION	
Are you a member of the World Conseravtion Union (IUCN)?	
Do you have a copy of the World Zoo Conservation Strategy – if yes, how does it influence your planning?	
Which version of the IUCN Red Data List do you use?	
EX SITU CONSERVATION	
Species Management Groups Are you represented on, or do you have links with any groups.	
Give details of and number of years of involvement with any of the following groups:	
Conservation Breeding Specialist Group (CBSG) Please give details	
European Endangered Species Programmes (EEPs) List EEPs your organisationtakes part in List EEPs or Taxon Advisory Groups your organisation chairs	
Joint Management of Species Programmes List JMSPs you organisation takes part in List JMSPs your organisation chairs Do you contribute ot any other species management programmes? Is so, please give details	

DETAILS OF INSTITUTION *continued*	
Studbooks	
Do you maintain studbooks? – If so, please give details of species	
International	
Regional	
Do you maintain studbook species. If so: How often do you report to the Studbook Keeper? List species	
Do you have an Animal Collection Plan – if so please attach. Are you in the process of preparing one, in which case when will it be available? If you have not got an animal collection plan how do you decide what species to keep?	Attach
IN-SITU CONSERVATION	
What resources does your zoo put into in-situ conservation: (a) Personnel (b) Financial (c) Other	
Have you collected funds for or supported financially any in-situ projects in the last three years? If yes, please list projects and nature of support	
Are you or have you been directly involved in any in situ projects, either by funding or more direct participation over the past three years? If so please give details.	
OTHER CONSERVATION ACTIVITIES	
Do you contribute to conservation in other ways? If so, please give details.	

DETAILS OF INSTITUTION *continued*	
EDUCATION	
List and briefly outline the major elements of the zoos education programme and policy or existing plan be attached	
Education staff numbers Paid Training scheme Volunteer	
Facilities Classrooms (number) Lecture theatre (number) Library Other	
Levels of education provided – tick which appropriate Nursery Primary Secondary University Adult Other	
Local Authority links: Staff Finance Curricula development Liaison	
Is your zoo a member of any zoo education network (eg British and Irish Zoo Educators)? If so, please give details	
How do you ensure the consistency and effectiveness of your education programme (eg. inspections, feed-back sheets, visitor surveys)?	
Teaching aids (including publications) – please give details and provide examples	
Give details of membership and links with groups concerned with environmental education.	
Informal educational aids – give details of what is used eg. labels, listening posts, public demonstrations, internal and external lectures etc	
Staff Training	
Are your staff required to take the National Extension College correspondence course in Zoo Animal Management?	

DETAILS OF INSTITUTION *continued*	
Do you organise your own staff training? – If so, state briefly how this is done.	
Do you provide training for other organisations? If so, please provide details.	
What qualifications do your education staff have? Please list by staff member.	
RESEARCH	
List and briefly outline the major elements of the zoos research policy programme	
What resources does the zoo put into research: (a) Personnel (b) Financial (c) Other Are research projects involving animals subject to ethical scrutiny?	
Breifly outline your ethical review process	
Please append details of any research carried out, during the last three years, by or on behalf of the zoo by (a) zoo staff (b) other organisations	
Has your zoo recieved any research grants? – If so, please give details	
Please list any scientific publications over the last three years by: (a) staff (b) others using your collection	
Do you have links with Higher Education Institutions? If so, what are these links?	

APPENDIX 11

Zoo Licensing Act 1981

Inspection Report

Date

Name of applicant or current licence holder Full postal address   Telephone number Postcode Facsimile number

Number
Date of last inspection Type of last inspection

Type of Inspection today *Tick*	Statutory composition of inspection team
Full new application.	DETR nominees
Full renewal	2 listed via DETR, 1 LA vet, option of <2 more from LA
Full periodical	2 listed via DETR, 1 LA vet, option of <2 more from LA
Full informal (annual intermediate)	1 competent LA appointee Licensing/HSE/Vet
Special	Any number of competent authorised LA appointees
Clause 14 (2) dispensation, periodical	1 or more DETR appointees
Clause 14 (2) dispensation, informal	1 competent LA appointee

Name & designation of Inspector	Signature	Name(s) of Zoo Representative(s)

Copies:

Original to Local Authority;

1st copy to applicant/operator

2nd copy to DETR

Purpose of next *inspection*

Timing of next inspection

ASSESSMENT OF THE PRE-INSPECTION AUDIT

Section	Assessment	Other Notes
Details of Institution		
Records		
Zoo Operations		
Veterinary Care		
Health and Safety Issues		
Security		
Risk Assessments		
Conservation		
Education		
Research		
Staff Training		

RESULTS OF INSPECTION

	Yes	No	N/A	Notes
1 Provision of food and water 1 Is food appropriate for the species/individual supplied? 2 Is natural feeding behaviour adequately catered for by established practices? 3 Are feeding methods safe for staff and animals? 4 Are supplies of food and water: kept hygienically? prepared hygienically? supplied to the animal hygienically? 5 Is feeding by visitors permitted and properly controlled?				
2 Provision of suitable environment 1 Are temperature, ventilation, lighting and noise levels appropriate? 2 Do animal enclosures have sufficient shelter? 3 Do animal enclosures provide sufficient space? 4 Are backup facilities for life support systems adequate? 5 Is the cleaning of the accommodation satisfactory? 6 Is the standard of maintenance of buildings and fences adequate? 7 Is all drainage effective & safe?				
3 Provision of animal health care 1 Are observations of condition and health made and recorded? 2 Do all animals receive prompt and appropriate attention when problems are noted? 3 Are enclosures designed and operated in such a way that social interaction problems are avoided?				

	Yes	No	N/A	Notes
On-site facilities 4 Are catch-up & restraint facilities adequate? 5 Are on-site veterinary facilities adequate? 6 Is darting equipment satisfactory? 7 Are controlled drugs used & recorded satisfactorily? *Veterinary Care* 4 Is a satisfactory programme of veterinary care established and maintained? 5 Are appropriate veterinary records kept? 6 Are medicines correctly kept? 7 Are appropriate antidotes available? 8 Are post-mortem arrangements satisfactory? *Quarantine* 9 Is adequate reserve accommodation available for isolation of animals for assessment, treatment, recovery etc? *Sanitation* 10 Does it appear that general sanitation and pest control are effective? 11 Is transport and movement equipment in good order?				
4 Provision of an opportunity to express most normal behaviour 1 Does accommodation appear adequately to meet the biological and behavioural needs of the animals? 2 Are active efforts made to enrich animal environments where necessary or advantageous? 3 Are enclosure barriers effective in containing animals? 4 Will the perimeter deter unauthorised entry and aid the confinement of zoo stock? 5 Are animals kept within the perimeter of the zoo? 6 Is captive breeding properly managed?				

	Yes	No	N/A	Notes
5 Provision of protection from fear & distress 1 Are animals handled only by or under the supervision of appropriately qualified staff? 2 Is physical contact between animals and the public consistent with the animals' welfare? 3 Are interactions between animals such that they are not excessively stressful?				
6 Conservation, Education & Research 1 Are on-site education facilities commensurate with the collection and adequate for the purposes? 2 Are the conservation efforts adequate? 3 Are the research efforts adequate?				
7 Public safety 1 Are adequate provisions made to contain hazardous animals within enclosures? 2 Do stand-off barriers appear adequate? 3 Are adequate warning signs provided? 4 Does maintenance of buildings appear adequate ? 5 Are exits clearly marked and accessible? 6 Do public areas and walkways appear safe?				
8 Records 1 Are daily diaries maintained? 2 Are animal stock records clear and up-to-date? 3 Are annual inventories maintained and submitted to the Local Authority? 4 Are animal source and destination records kept? 5 Are archived records secure?				

	Yes	No	N/A	Notes
9 Miscellaneous 1 Do staff numbers appear adequate? 2 Are effective risk assessments carried out where appropriate? 3 Is adequate Public Liability Insurance current? 4 Are toilet facilities adequate and serviced? 5 Are the reasonable needs of disabled met? 6 Are prohibited areas appropriately signed? 7 Is an accident reporting and recording system in use? 8 Is a First Aid Policy in effect?				
Associated legislation 1 Is electrical equipment routinely serviced? 2 Have fire precautions been agreed and implemented? 3 Is refuse disposed of correctly?				
Compliance check 1 Is current licence on display at entrance? 2 Have there been any escapes since last Inspection? 3 Have there been any significant accidents? 4 Have existing licence conditions been met?				

THE FOLLOWING SPACE IS PROVIDED FOR:

- ADDITIONAL NOTES AND COMMENTS ON THE ANSWERS TO THE EARLIER QUESTIONS
- RECOMMENDATIONS (OTHER THAN IN RESPECT OF GRANT OR REFUSAL OF A LICENCE AND ANY SPECIFIC CONDITIONS RECOMMENDED FOR A LICENCE ñ FOR WHICH SEE OVER).
- ANY GENERAL REMARKS WHICH THE INSPECTING TEAM MAY WISH TO RECORD

INSPECTING TEAM'S RECOMMENDATION TO THE LOCAL AUTHORITY

Having inspected

on:

The inspecting team make the following recommendation:

- It is recommended that a licence be refused.
- It is recommended that the above collection be licensed in accordance with the Act subject to the Standard Conditions
- It is recommended that the above collection be licensed in accordance with the Act subject to the Standard Conditions and the following additional conditions:

(delete as necessary)

Signed.

CHAPTER 12

Dangerous Animal Categorisation

Animal Kinds, with Respect to Danger to Members of the Public Visiting Zoological Gardens

Categorisation of animal kinds, according to likely ferocity and ability to cause harm to people are shown according to risk levels:

Category '1' Common name 1 Greater Risk

Category '2' Common name 2 Less Risk

Category '3' Common name 3 Least Risk

Category '1' (Greater Risk)

1.1 Those kinds of animals which, by their natural ferocity and their natural ability to cause harm, depending on the circumstances of possible encounter (see 1.4 and Note 3 below), are likely to present hazards when not separated from members of the public visiting zoological gardens.

1.2 Animals in Category '1' species must either be separated from the public by a barrier of suitable design in order to prevent physical contact between the animals and members of the public within their designated areas, or, with the prior approval of the Licensing Authority, are provided with adequate supervision to allow the public and the animals to be in the same area without hazard.

1.3 The responsibility for any relaxation of the need to provide non-touch barriers (i.e. prevent direct contact between animal and public) for Category '1' species lies with the Licensing Authority, acting upon the advice of Inspectors nominated by the Secretary of State.

1.4 Animals in Category '1' may only be taken out of their enclosures and into the same areas as members of the public, or the public into the animals' enclosures, if the operator of the zoological gardens, being the keeper of the animals, has reason to believe, by virtue of the animals' ages, sexual states, supervision, training, individual histories, enclosure size and design, or other relevant matters, and having satisfied the Licensing Authority that he has such reason that the animals, being under the supervision of authorised and experienced members of staff, will not cause injury to the public.

Category '2' (Less Risk)

2.1 Those kinds of animals which are either less ferocious or less capable of causing injury, or both, than those kinds listen in Category '1', but which warrant a higher level of caution than Category '3'.

2.2 Animals in Category '2' species would normally be separated from the public by a barrier, but this barrier need not, of necessity, prevent all physical contact between the animals and members of the public, though it should be such as to render negligible any risk involved. The responsibility for assessing the kind of barriers needed for Category '2' species lies with the operator of the Zoological Garden, who must take into account the behaviour of the individual animals and of other factors as are relevant to each situation.

2.3 Some category '2' species, given adequate space and refuge, may be maintained as free-ranging, free-flying or walk-through exhibits. In these circumstances the operator must be able to satisfy the Licensing Authority, citing relevant experience, that it is reasonable that the species involved can be safely exhibited in the manner proposed. The operator also must be able to satisfy the Licensing Authority that the individual animals in such exhibits are unlikely to cause harm to members of the public.

2.4 The operator of the zoological garden, keeping an animal in a Category '2' which has behaved in a way which has caused injury, or was likely to have caused injury or transmitted disease, is obliged to treat that animal as if in a Category '1' species.

Category '3' (Least Risk)

3.1 Those kinds of animals which are either not naturally ferocious or are not able to inflict appreciable injury, or both, and therefore do not present a hazard to members of the public visiting zoological gardens.

3.2 The 'keeper' of any individual animal in a Category '3' species which has behaved in a way which has caused injury, or was likely to have caused injury or transmit disease, is obliged to treat that animal as if in a Category '1' species.

THE FOLLOWING NOTES ARE ADDITIONAL TO THE ABOVE AND ARE INTENDED TO HELP INSPECTORS TO INTERPRET THE CATEGORISATIONS AND THE LISTINGS.

Note 1 This list is intended to indicate the level of hazard to members of the public from animals kept in premises licensed under the Zoo Licensing Act, 1981. It should not be interpreted as indicating the level of hazard from animals encountered in any other circumstances. In particular it should not be used to indicate the level of hazard from animals kept in homes, circuses, pet shops and other places not covered by the Zoo Licensing Act, 1981, which are subject to the Dangerous Wild Animals Act, 1976, for which a separate schedule exists.

Note 2 a Category '1' species may only be exhibited to the public in the absence of non-touch barriers with the prior approval of the Licensing Authority.

b Category '2' species may, under certain circumstances be exhibited to the public in the absence of non-touch barriers. Though prior approval by the Licensing Authority is not required, the operator of the Zoological Garden must be able to provide the Licensing Authority with precedents and other relevant information which show the practice to be safe. In cases of doubt, or where there is no precedent, the operator should seek the advice of a suitably knowledgeable member of the Zoos Forum (who may if necessary, consult the Federation of Zoological Gardens of Great Britain and Ireland).

c Where Category '2' species are exhibited without non-touch barriers e.g. in walk-through areas, areas with no stand-off barriers, exhibits involving public handling, free flying displays the details of the practices being followed must be recorded in writing and be made available to the Inspectors under the Zoo Licensing Act, 1981 and the Local Authority, at the time of any subsequent inspection.

Note 3 The likelihood of bites, pecks, scratches, etc. caused by any individual animal which is in unusual circumstances (for example which is being injudiciously held, or cornered), is not to be taken as a measure of the natural ferocity of a species.

Note 4 In some species, e.g. those which live in herds, there is a greater likelihood of attack and injury from the leading animals (usually the leading males) than from other members of the group, especially in any breeding season. Extra caution is required at such times. In mammal species in which the young accompany the females, nursing females are likely to present a higher level of risk than at other times. Birds defending eggs and hatchlings are likely to present a higher level of risk than at other times.

Note 5 Animals normally domesticated in Britain have not been included in this list. Attention is drawn to the possibility that individuals in such species may be very dangerous.

Note 6 In most species, the young do not present the same order of hazard as might be expected from adults (except in the case of venomous animals). Whilst in some instances hand-reared animals are safer than naturally reared animals, this is not always so, particularly with species of wild ungulates and many species of birds. Because of their very small size; young of many hazardous invertebrate species require more stringent security than the larger adults. Unless otherwise stated in the list below, the age, size or sex of a specimen of a Category 1 species cannot be used to justify treating it as a lower category of risk, except with the prior approval of the Licensing authority (see 1.3, 1.4 and note 2a above)

Note 7 The list below is intended to embrace all known extant species of mammals, birds, reptiles and amphibians, though no attempt has been made to do more than list the kinds of fish and invertebrates which are thought to present significant hazards in zoological gardens and aquaria. Any variation in classification and nomenclature may not be taken to imply that the categorisation of a species has changed. It is not intended that the full list of kinds included in Category '3' is to be issued, but that it should be available for reference. In the cases of Fishes and Invertebrates, an exhaustive review of all possible kinds has not been undertaken.

Note 8 Hybrid animals should be placed in the same category as the more hazardous of the parent species.

Note 9 The phrase 'natural ferocity' is intended to indicate the likelihood of a harmful occurrence taking place.

Note 10 The phrase 'natural ability to cause harm' is intended to indicate the magnitude of the consequences of a harmful occurrence.

Note 11 In the case of bird species listed in Category '2' (Less Risk), attention is drawn to the hazard of injury from beaks, and talons, in particular in the case of birds which are tethered in mews, e.g. Birds of Prey and Parrots. Such birds should, when unsupervised, be separated by a non-touch barrier from members of the public.

Note 12 a Attention is drawn to the hazard of all zoonotic infections, but with particular emphasis to the possible higher risks of humans contracting *Chlamydia* infection from some birds, including parrots and related species, and *Salmonella* and similar infections from some reptiles, including tortoises, if they are closely handled.

b It is also stressed that the higher primates are more closely related to man and may, therefore, be more likely to carry zoonotic diseases. The risk of serious disease being carried in this manner is greater in imported animals than in long-established groups. There is also the risk of higher primates acting as intermediaries in the transfer of disease from one human to another.

Note 13 Attention is drawn to the possibly higher risk of humans contracting rabies from many mammalian species, should the disease become indigenous. The risk from newly imported animals is controlled under quarantine regulations and is outside the scope of these provisions.

CATEGORISATIONS AND LISTINGS

Class Mammalia			
Order MONOTREMATA			
Family Tachyglossidae			
Tachyglossus	Short-nosed Echidna)	3	Least Risk
Zaglossus	Long-nosed Echidna)		
Family Ornithorhynchidae			
Ornithorhynchus	Platypus	3	Least Risk
Order MARSUPIALIA			
Family Didelphidae			
Marmosa	Mouse Opossums	3	Least Risk
Monodelphis	Short-tailed Opossums	3	Least Risk
Lestodelphis	Patagonian Opossum	3	Least Risk
Metachirus	Brown Four-eyed Opossums	2	Less Risk
Didelphis	Large Opossums	2	Less Risk
Metachirops	Philanders or Four-eyed Opossums	2	Less Risk
Lutreolina	Thick-tailed Opossum	2	Less Risk
Chironectes	Yapok or Water Opossum	2	Less Risk
Caluromys	Woolly Opossums	3	Least Risk
Caluromysiops	Black-shouldered Opossum	3	Least Risk
Glironia	Bushy-tailed Opossums	3	Least Risk
Family Microbiotheridae			
Dromiciops	Colocolo	3	Least Risk
Family Caenolestidae			
Caenolestes)			
Lestoros)-	Shrew-opossums	3	Least Risk
Rhyncholestes)			
Family Dasyuridae			
Murexia	Short-haired Marsupial Mice	3	Least Risk
Neophascogale	Long-clawed Marsupial Mice	3	Least Risk
Phascalosorex	Marsupial Mice	3	Least Risk
Myoictis	Three-striped Marsupial Mouse	3	Least Risk
Planigale	Planigales	3	Least Risk
Antechinus	Dibblers and Antechines	3	Least Risk
Phascogale	Wambengers	3	Least Risk
Dasycercus	Mulgara	3	Least Risk
Dasyurus	Quolls & Native Cats	2	Less Risk
Sarcophilus	Tasmanian Devil	1	Greater Risk
Dasyuroides	Kowari	2	Less Risk
Ningaui	Ningaus	3	Least Risk
Sminthopsis	Dunnarts	3	Least Risk
Antechinomys	Kultarr or Wuhl-wuhl	3	Least Risk

Family Myrmecobiidae			
Myrmecobius	Numbat or Banded Anteater	3	Least Risk
Family Thylacinidae			
Thylacinus	Tasmanian Wolf (probably extinct)	1	Greater Risk
Family Notoryctidae			
Notoryctes	Marsupial Mole	3	Least Risk
Family Peramelidae			
Peroryctes }			
Microperoryctes }			
Perameles }			
Echymipera }–	Bandicoots	3	Least Risk
Rhynchomeles }			
Isodon }			
Chaeropus }			
Family Thylacomyidae			
Macrotis	Rabbit Bandicoots	3	Least Risk
Family Phalangeridae			
Trichosurus	Brush-tailed Possums	2	Less Risk
Wyulda	Scaly-tail Possum	3	Least Risk
Phalanger	Phalangers	3	Least Risk
Family Burramyidae			
Cercatetus)			
Distoechurus)–	Pygmy Possums	3	Least Risk
Acrobates)			
Burramys)			
Family Petauridae			
Gymnobelideus	Leadbetter's Possum)		
Petaurus	Gliders)		
Pseudocheirus	Ringtail Possums)–	3	Least Risk
Schoinobates	Greater Glider)		
Dactylopsila	Striped Possum)		
Family Macropodidae			
Hypsiprymnodon)			
Potorous)			
Bettongia)			
Aepyprymnus)			
Caloprymnus)–	Rat Kangaroos, Rock & Hare		
Thylogale)	Wallabies	3	Least Risk
Petrogale)			
Peradorcas)			
Lagorchestes)			
Setonyx)			
Lagostrophus)			

Family Macropodidae (*continued*)			
Macropus			
M. rufus	Red Kangaroo (adult males)	1	Special Kicking Risk
	(females & young)	2	Less Risk
M. giganteus	Great Grey Kangaroo(adult males)	1	Special Kicking Risk
	(females & young)	2	Less Risk
M. fuliginosus	Western Grey Kangaroo(adult males)	1	Special Kicking Risk
	(females & young)	2	Less Risk
M. robustus	Wallaroo or Euro(adult males)	1	Special Kicking Risk
	(females & young)	2	Less Risk
M. antilopinus	Antelope Kangaroo	2	Less Risk
M. species	Smaller Kangaroos	3	Least Risk
Wallabia)			
0nychogalea)			
Dendrolagus)–	Wallabies & Tree Kangaroos	3	Least Risk
Dorcopsis)			
Dorcopsulus)			
Family Phascolarctidae			
Phascolarctos	Koala	2	Less Risk
Family Vombatidae			
Vombatus	Common Wombat	2	Less Risk
Lasiorhinus	Hairy-nosed Wombat	2	Less Risk
Family Tarsipedidae			
Tarsipes	Honey Possum	3	Least Risk
Order INSECTIVORA			
Family Solenodontidae			
Solenodon	Solenodons	2	Less Risk
Family Tenrecidae			
Tenrec)			
Setifer)			
Hemicentetes)			
Dasogale)			
Echinops)–	Tenrecs	3	Least Risk
0ryzorictes)			
Microgale)			
Limnogale)			
Geogale)			
Potamogale)			
Micropotamogale)			

Family Chrysochloridae				
Chrysochloris	)			
Eremitalpa	)			
Calcochloris	)			
Cryptochloris	)–	Golden Moles	3	Least Risk
Amblysomus	)			
Chlorotalpa	)			
Chrysospalax	)			
Family Erinaceidae				
Echinosorex		Moonrat	2	Less Risk
Hylomys		Lesser Moonrat	2	Less Risk
Podogymnura		Mindanao Moonrat	2	Less Risk
Neotetrcacus		Shrew-hedgehog	3	Least Risk
Neohylomys		Hainan Moonrat	2	Less Risk
Erinaceus	)			
Hemiechinus	)–	Hedgehogs	3	Least Risk
Paraechinus	)			
Family Soricidae				
Sorex		)		
Microsorex	)			
Soriculus	)			
Neomys	)			
Blarina	)			
Blarinella	)			
Cryptotis	)			
Notiosorex	)			
Megasorex	)			
Crocidura	)–	Shrews	3	Least Risk
Suncus	)			
Feroculus	)			
Solisorex	)			
Paracrocidura	)			
Sylvisorex	)			
Myosorex	)			
Diplomesodon	)			
Anourosorex	)			
Chimarrogale	)			
Nectogale	)			
Scutisorex	)			

Family Talpidae			
Uropsilus)			
Desmana)			
Galemys)			
Talpa)			
Scaptomys)–	Moles	3	Least Risk
Neurotrichus)			
Scapanulus)			
Parascalops)			
Scapanus)			
Scalopus)			
Condylura)			
Order MACROSCELIDEA			
Family Macroscelididae			
Macroscelides)			
Elephantulus)–	Elephant Shrews	3	Least Risk
Petrodromus)			
Rhynchocyon)			
Order DERMOPTERA			
Family Cynocephalidae			
Cynocephalus	Flying Lemur or Colugo	3	Least Risk
Order CHIROPTERA			
Sub-order Megachiroptera			
Family Pteropodidae			
Eidolon)			
Rousettus)			
Lissonycteris)			
Myonycteris)			
Boneia)			
Pteropus)			
Pteralopex)			
Acerodon)			
Neopteryx)			
Styloctenium)–	Fruit Bats	2	Less Risk
Plerotes)			
Hypsignathus)			
Epomops)			
Epomophorus)			
Micropterus)			
Nanonycteris)			
Scotonycteris)			
Casinycteris)			
Cynopterus)			
Megaerops)			

Family Pteropodidae *continued*			
Ptenochirus)			
Dyacopterus)			
Chironax)			
Latidens)			
Penthetor)			
Thoopterus)			
Aproteles)			
Sphaerias)			
Balionycteris)			
Aethalops)			
Haplonycteris)			
Alionycteris)–	Fruit Bats	2	Less Risk
Otopteropus)			
Harpionycteris)			
Nyctimene)			
Paranyctimene)			
Eonycteris)			
Megaloglossus)			
Macroglossus)			
Syconycteris)			
Melonycteris)			
Nesonycteris)			
Notopteris)			
Sub-order Microchiroptera			
Family Rhinopomatidae			
Rhinopoma	Mouse-tailed Bats	3	Least Risk
Family Emballonuridae			
Emballonura)			
Coleura)			
Rhynchonycteris)			
Saccopteryx)			
Cormura)			
Peropteryx)-	Old World Sheath-tailed Bats	3	Least Risk
Peronymus)			
Centronycteris)			
Balantiopteryx)			
Taphozous)			
Diclidurus)–	Old World Sheath-tailed Bats	3	Least Risk
Depanycteris)			
Cyttarops)			
Family Craseonycteridae			
Craseonycteris	Hog-nosed Bats	3	Least Risk

Family Nycteridae				
Nycteris	Slit-faced Bats		3	Least Risk
Family Megadermatidae				
Megaderma	False Vampires	)		
Macroderma	Ghost Bat	)–	3	Least Risk
Cardioderma	Heart-nosed Bat	)		
Lavia	Yellow-winged Bat	)		
Family Rhinolophidae				
Rhinolophus	Horseshoe Bats		3	Least Risk
Family Hipposideridae				
Hipposideros	)			
Asellia	)			
Aselliscus	)			
Anthops	)			
Cloeotis	)–	Old World Leaf-nosed Bats	3	Least Risk
Rhinonycteris	)			
Tricaenops	)			
Coelops	)			
Paracoelops	)			
Family Noctilionidae				
Noctilio	Bulldog Bats		3	Least Risk
Family Mormoopidae				
Pteronotus	Naked-backed Bats	)	3	Least Risk
Mormoops	Ghost-faced Bats	)		
Family Phyllostomatidae				
Micronycteris	)			
Bartionycteris	)			
Macrotus	)			
Lonchorhina	)			
Macrophyllum	)			
Tonatia	)			
Mimon	)			
Phyllostomus	)–	New World Leaf-nosed Bats	3	Least Risk
Phylloderma	)			
Trachops	)			
Chrotopterus	)			
Vampyrum	)			
Glossophaga	)			
Monophyllus	)			
Leptonycteris	)			
Lonchophylla	)			
Lionycteris	)			
Anoura	)			
Scleronycteris	)			

Lichonycteris	)			
Hylonycteris	)			
Platalina	)			
Choeroniscus	)			
Choeronycteris	)			
Musonycteris	)			
Carollia	)			
Rhinophylla	)–	New World Leaf-nosed Bats	3	Least Risk
Sturnira	)			
Uroderma	)			
Vampyrops	)			
Vampyrodes	)			
Vampyressa	)			
Chiroderma	)			
Ectophylla	)			
Artibeus	)			
Enchisthenes	)			
Ardops		)		
Phyllops	)			
Ariteus	)			
Stenoderma	)			
Pygoderma	)			
Ametrida	)			
Sphaeronycteris	)			
Centurio	)			
Brachyphylla	)			
Erophylla	)			
Phyllonycteris	)			
Family Desmodontidae				
Desmodus	)			
Diaemus	)–	Vampire Bats	1	Special Rabies Risk
Diphylla	)			
Family Natalidae				
Natalus		Funnel-eared Bats	3	Least Risk
Family Furipteridae				
Furipterus	)	Smoky Bats	3	Least Risk
Amorphochilus	)			
Family Thyropteridae				
Thyroptera		Disc-Winged Bats	3	Least Risk

Family Vespertilionidae				
Myotis	)			
Pizonyx	)			
Lasionycteris	)			
Eudiscopus	)			
Pipistellus	)			
Scotozous	)			
Nyctalus	)			
Glischropus	)			
la	)			
Vespertilio	)			
Laephotis	)			
Histiotus	)			
Philetor	)			
Tylonycteris	)			
Mimetillus	)			
Hesperotenus	)			
Glauconycteris	)–	Evening Bats	3	Least Risk
Chalinolobus	)			
Scotoecus	)			
Nycticeius	)			
Rhogeesa	)			
Baeodon	)			
Scotomanes	)			
Scotophilus	)			
0tonycteris	)			
Lasiurus	)			
Dasypterus	)			
Barbastella	)			
Plecotus	)			
Idionycteris	)			
Euderma	)			
Miniopterus	)			
Murina	)			
Harpiocephalus	)			
Kerivoula	)			
Phoniscus	)			
Antrozous	)			
Lamingtona	)			
Nyctophilus	)			
Pharotis	)			
Tomopeas	)			

Family Myzopodidae			
Myzopoda	Madagascan Sucker-footed Bat	3	Least Risk
Family Mystacinidae			
Mystacina	New Zealand Short-tailed Bat	3	Least Risk
Family Molossidae			
Tadarida)			
Xiphonycteris)			
Otomops)			
Neoplatymops)			
Sauromops)			
Platymops)–	Free-tailed Bats	3	Least Risk
Myopterus)			
Molossops)			
Eumops)			
Promops)			
Molossus)			
Cheiromeles)			
Order SCANDENTIA			
Family Tupaiidae			
Tupaia)			
Anathana)			
Dendrogale)–	Tree Shrews	3	Least Risk
Urogale)			
Ptilocercus)			
Order PRIMATES			
Family Cheirogaleidae			
Microcebus)			
Cheirogaleus)	Dwarf Lemurs &		
Allocebus)	Mouse Lemurs	3	Least Risk
Phaner)			
Family Lemuridae			
Lemur	Lemurs	2	Less Risk
Hapalemur	Gentle Lemur	3	Least Risk
Varecia	Ruffed Lemur	2	Less Risk
Lepilemur	Weasel & Sportive Lemurs	2	Less Risk
Family Indriidae			
Avahi	Woolly Indris	2	Less Risk
Propithecus	Sifakas	2	Less Risk
Indri	Indris	2	Less Risk
Family Daubentonidae			
Daubentonia	Aye-Aye	2	Less Risk

Family Lorisidae			
Sub-family Lorisinae			
Loris)			
Nycticebus)–	Lorises	3	Least Risk
Perodicticus)			
Arctocebus)			
Sub-family Galaginae			
Galago)			
Otolemur)–	Bushbabies	3	Least Risk
Euoticus)			
Galagoides)			
Family Tarsiidae			
Tarsius	Tarsiers	3	Least Risk
Family Callitrichidae			
Callithrix)			
Cebuella)			
Saguinus)–	Marmosets & Tamarins	2	Less Risk
Leontopithecus)			
Callimico)			
Family Cebidae			
Cebus	Capuchin Monkeys		
	(adult males)	1	Greater Risk
	(females & young)	2	Less Risk
Aotus	Douroucouli	2	Less Risk
Callicebus	Titis	2	Less Risk
Saimiri	Squirrel Monkeys	2	Less Risk
Pithecia	Sakis	2	Less Risk
Cacajao	Uakaris	2	Less Risk
Chiropotes	Sakis	2	Less Risk
Alouatta	Howler Monkeys	1	Greater Risk
Ateles	Spider Monkeys		
	(adult males)	1	Greater Risk
	(females & young)	2	Less Risk
Brachyteles	Woolly Monkeys		
	(adult males)	1	Greater Risk
	(females & young)	2	Less Risk
Lagothrix	Woolly Spider Monkeys		
	(adult males)	1	Greater Risk
	(females & young)	2	Less Risk

Family Cercopithecidae			
Sub-family Cercopithecinae			
Macaca	Macaques	1	Greater Risk
Cercocebus	Mangabeys	1	Greater Risk
Papio	Baboons	1	Greater Risk
Mandrillus	Mandrill	1	Greater Risk
Theropithecus	Gelada	1	Greater Risk
Cercopithecus	Guenons	1	Greater Risk
Miopithecus	Talapoin Monkey	2	Less Risk
Allenopithecus	Allen's Monkey	1	Greater Risk
Erythrocebus	Patas Monkey	1	Greater Risk
Sub-family Colobinae			
Colobus	Colobus Monkeys	2	Less Risk
Procolobus	Olive Colobus	2	Less Risk
Pygathrix	Snub-nosed & Douc Langur	2	Less Risk
Nasalis	Proboscis Monkey	2	Less Risk
Presbytis	Langurs	2	Less Risk
Family Pongidae			
Hylobates	Gibbons	1	Greater Risk
Pongo	Orang-utan	1	Greater Risk
Pan	Chimpanzees	1	Greater Risk
Gorilla	Gorilla	1	Greater Risk
Order EDENTATA			
Family Myrmecophagidae			
Myrmecophaga	Giant Ant-eater	1	Greater Risk
Tamandua	Tamandua	2	Less Risk
Cyclopes	Pygmy or Silky Anteater	3	Least Risk
Family Bradypodidae			
Bradypus	Three-toed Sloths	1	Greater Risk
Choloepus	Two-toed Sloths	1	Greater Risk
Family Dasypodidae			
Euphractus	Six-banded Armadillo	3	Least Risk
Zaedyus	Pichi	3	Least Risk
Priodontes	Giant Armadillo	2	Less Risk
Cabassous	Broad-banded Armadillos	3	Least Risk
Tolypeutes	Three-banded Armadillos	3	Least Risk
Dasypus	Armadillos	3	Least Risk
Chlamyphorus	Fairy Armadillo	3	Least Risk
Calyptophractus	Burmeister's Armadillo	3	Least Risk
Order PHOLIDOTA			
Family Manidae			
Manis	Pangolins	3	Least Risk

Order LAGOMORPHA			
Family Ochotonidae			
Ochotona	Pikas	3	Least Risk
Family Leporidae			
Pentalagus)			
Pronolagus)			
Romerolagus)			
Caprolagus)			
Lepus)–	Rabbits & Hares	3	Least Risk
Poelagus)			
Sylvilagus)			
0ryctolagus)			
Nesolagus)			
Order RODENTIA			
Sub-order Sciuromorpha			
Family Aplodontidae			
Aplodontia	Mountain Beaver	3	Least Risk
Family Sciuridae			
Sciurus)			
Syntheosciurus)			
Microsciurus)			
Sciurillus)–	Squirrels	3	Least Risk
Prosciurillus)			
Rheithrosciurus)			
Tamiasciurus)			
Funambulus)			
Ratufa)	Giant Squirrels	2	Less Risk
Protoxerus)			
Epixerus)			
Funisciurus)			
Paraxerus)			
Heliosciurus)			
Myosciurus)			
Callosciurus)			
Sundasciurus)			
Menetes)			
Rhinosciurus)			
Lariscus)			
Dremomys)			
Sciurotamias)			
Glyphotes)			
Nannosciurus)			
Exilisciurus)			

Family Sciuridae *continued*			
Atlantoxerus)–	Squirrels, Marmots		
Xerus)	& Flying Squirrels	3	Least Risk
Spermophilus)			
Marmota)			
Cynomys)			
Ammospermophilus)			
Tamias)			
Petuarista)			
Eupetaurus)			
Pteromys)			
Glaucomys)			
Aeromys)			
Hylopetes)			
Petinomys)			
Aeretes)			
Trogopterus)			
Belomys)			
Pteromyscus)			
Petaurillus)			
lomys)			
Family Geomyidae			
Geomys)			
Thomomys)			
Pappogeomys)–	Pocket Gophers	3	Least Risk
Orthogeomys)			
Zygogeomys)			
Family Heteromyidae			
Perognathus)			
Microdipodops)			
Dipodomys)–	Kangaroo Mice & Pocket Mice	3	Least Risk
Liomys)			
Heteromys)			
Family Castoridae			
Castor	Beaver	2	Less Risk
Family Anomaluridae			
Anomalurus)			
Idiurus)–	Scaly-tailed Flying Squirrels	3	Least Risk
Zenkerella)			
Family Pedetidae			
Pedetes	Spring Haas	3	Least Risk

Sub-order Myomorpha

Family Muridae

Sub-family Hesperomyinae

Oryzomys)			
Megalomys)			
Wiedomys)			
Neacomys)			
Scolomys)			
Nectomys)			
Rhipidomys)			
Thomasomys)			
Phaenomys)			
Chilomys)			
Tylomys)			
Ototylomys)—	New World Rats & Mice	3	Least Risk
Nyctomys)			
Otonyctomys)			
Rhagomys)			
Reithrodontomys)			
Peromyscus)			
Ochrotomys)			
Baiomys)			
Onychomys)			
Akodon)			
Abrothrix)			
Bolomys)			
Chroeomys)			
Hypsimys)			
Microxus)			
Talpomys)			
Thaptomys)			
Cabreramys)			
Zygodontomys)			
Podoxymys)			
Lenoxus)			
Oxymycterus)			
Juscelinomys)			
Blarinomys)			
Notiomys)			
Kunsia)			
Scapteromys)			
Scotinomys)			
Calomys)			
Eligmodontia)			

Sub-family Hesperomyinae *continued*			
Graomys)			
Andalgalomys)			
Pseudoryzomys)			
Phyllottis)			
Auliscomys)			
Irenomys)			
Chinchillula)			
Punomys)			
Neotomys)			
Reithrodon)			
Euneomys)			
Holochilus)–	New World Rats & Mice	3	Least Risk
Sigmodon)			
Andinomys)			
Neotomodon)			
Neotoma)			
Nelsonia)			
Xenomys)			
Ichthyomys)			
Anotomys)			
Daptomys)			
Rheomys)			
Neusticomys)			
Calomyscus)			
Sub-family Cricetinae			
Phodopus)			
Cricetus)	Hamsters	3	Least Risk
Cricetulus)			
Mesocricetus)			
Sub-family Spalacinae			
Spalax	Blind Mole-rats	3	Least Risk
Sub-family Myospalacinae			
Myospalax	Asiatic Mole-rats	3	Least Risk
Sub-family Lophiomyinae			
Lophiomys	Crested Rat	3	Least Risk
Sub-family Platacanthomyinae			
Platacanthomys)	Spiny Dormice	3	Least Risk
Typhlomys)			

Sub-family Nesomyinae			
Macrotarsomys)			
Nesomys)			
Brachytarsomys)			
Eliurus)–	Madagascan Rats	3	Least Risk
Gymnuromys)			
Hypogeomys)			
Brachyuromys)			
Mystromys)			
Sub-family Otomyinae			
Otomys)–	Swamp Rats	3	Least Risk
Parotomys)			
Sub-family Rhizomyinae			
Tachyoryctes)			
Rhizomys)–	Mole-rats & Bamboo Rats	3	Least Risk
Cannomys)			
Sub-family Microtinae			
Dicrostonyx)			
Synaptomys)			
Myopus)			
Lemmus)			
Cleithrionomys)			
Eothenomys)			
Alticola)			
Hyperacrius)–	Voles & Lemmings	3	Least Risk
Dinaromys)			
Arvicola)			
0ndatra)			
Neofiber)			
Phenacomys)			
Pitymys)			
Microtus)			
Lagurus)			
Prometheomys)			
Ellobius)			
Sub-family Gerbillinae			
Gerbillus)			
Gerbillurus)			
Dipodi11us)			
Microdil1us)			
Tatera)			
Taterillus)			
Desmodillus)			
Desmodilliscus)			

Sub-family Gerbillinae *continued*				
Pachyuromys	)–	Gerbils & Jirds	3	Least Risk
Ammodillus	)			
Sekeetamys	)			
Meriones	)			
Brachiones	)			
Psammomys	)			
Rhombomys	)			
Sub-family Dendromurinae				
Delanymys	)			
Dendromys	)			
Dendroprionomys	)			
Deomys	)			
Leimacomys	)–	African Climbing Mice	3	Least Risk
Malacothrix	)			
Megadendromus	)			
Petromyscus	)			
Steatomys	)			
Prionomys	)			
Sub-family Cricetomyinae				
Beamys	)			
Saccostomus	)–	African Pouched Rats	3	Least Risk
Cricetomys	)			
Sub-family Murinae				
Hapalomys	)			
Vernaya	)			
Tokudaia	)			
Vandeleuria	)			
Micromys	)			
Apodemus	)			
Thamnomys	)–	Mice	3	Least Risk
Carpomys	)			
Mindanaomys	)			
Batomys	)			
Pithecheir	)			
Hyomys	)			
Conilurus	)			
Zyzomys	)			
Mesembriomys	)			
Oenomys	)			
Mylomys	)			
Dasymys	)			
Arvicanthis	)			
Hadromys	)			

Sub-family Murinae *continued*				
Golunda	)			
Pelomys	)			
Lemniscomys	)			
Rhabdomys	)			
Hybomys	)			
Millardia	)			
Dacnomys	)			
Eropeplus	)			
Stenocephalemys	)			
Rattus	)			
Maxomys	)			
Aethomys	)			
Thallomys	)			
Praomys	)			
Limnomys	)			
Stochomys	)			
Tarsomys	)			
Tryphomys	)			
Leporillus	)			
Leggadina	)			
Pseudomys	)			
Melomys	)			
Pogonomelomys	)			
Solomys	)			
Uromys	)			
Xenuromys	)			
Malacomys	)			
Haeromys	)			
Chiromyscus	)			
Diomys	)			
Zelotomys	)			
Muriculus	)			
Mus	)			
Colomys	)			
Nesoromys	)			
Crunomys	)			
Macruromys	)			
Lorentzimys	)			
Lophuromys	)			
Notomys	)			
Mastacomys	)			
Echinothrix	)			
Melasmothrix	)–	Mice	3	Least Risk

Sub-family Murinae *continued*				
Tateomys	)			
Acomys	)			
Uranomys	)			
Bandicota	)			
Nesokia	)			
Asinomys	)			
Lenomys	)			
Pogonomys	)			
Chiropodomys	)			
Mallomys	)			
Papagomys	)			
Phloeomys	)			
Crateromys	)			
Sub-family Hydromyinae				
Chrotomys	)			
Celaenomys	)			
Crossomys	)			
Xeromys	)–	Island Water Rats	3	Least Risk
Hydromys	)			
Parahydromys	)			
Neohydromys	)			
Leptomys	)			
Paraleptomys	)			
Pseudohydromys	)			
Microhydromys	)–	Island Water Rats	3	Least Risk
Mayermys	)			
Rhynchomys	)			
Family Gliridae				
Glis		Fat or Edible Dormouse)		
Muscardinus		Hazel Dormouse)		
Eliomys		Garden Dormouse)		
Dryomys		Woolly and Forest Dormice)–	3	Least Risk
Glirurus		Japanese Dormouse)		
Myomimus		Mouse-tailed Dormouse)		
Graphiurus		African Dormice)		
Family Seleviniidae				
Selevinia		Desert Dormouse	3	Least Risk
Family Zapodidae				
Sicista	)	Birch Mice	3	Least Risk
Zapus	)			
Eozapus	)–	Jumping Mice	3	Least Risk
Napaeozapus	)			

Family Dipodidae				
Dipus	)			
Paradipus	)			
Jaculus	)			
Stylodipus	)			
Allactaga	)–	Jerboas	3	Least Risk
Alactagulus	)			
Pygeretmus	)			
Cardiocranius	)			
Salpingotus	)			
Euchoreutes	)			
Sub-order Hystricomorpha				
Family Hystricidae				
Thecurus		Indonesian Porcupines	2	Less Risk
Hystrix		Porcupines	2	Less Risk
Atherurus		Brush-tailed Porcupine	2	Less Risk
Trichys		Long-tailed Porcupine	2	Less Risk
Family Erithizontidae				
Erithizon		North American Porcupine	2	Less Risk
Coendou		Tree Porcupine	2	Less Risk
Echinoprocta		Amazon Porcupine	2	Less Risk
Chaetomys		Thin-spined Porcupine	2	Less Risk
Family Caviidae				
Cavia	)			
Kerodon	)–	Cavies	3	Least Risk
Galea	)			
Microcavia	)			
Dolichotis		Mara	3	Least Risk
Family Hydrochoeridae				
Hydrochoerus		Capybara	2	Less Risk
Family Dinomyidae				
Dinomys		Paca-rana	2	Less Risk
Family Dasyproctidae				
Cuniculus		Pacas	2	Less Risk
Dasyprocta		Agoutis	)– 3	Least Risk
Myoprocta		Acouchis	)	
Family Chinchillidae				
Lagostomus		Plains Viscacha	)	
Lagidium		Mountain Viscachas	)– 3	Least Risk
Chinchilla		Chinchillas	)	
Family Capromyidae				
Capromys		Hutias	2	Less Risk
Plagiodontia		Hispaniola Hutia	2	Less Risk
Myocastor		Coypu	2	Less Risk

Family Octodontidae				
Octodon	)			
Octodontomys	)			
Spalacopus	)–	Degus	3	Least Risk
Aconaemys	)			
Octomys	)			
Family Ctenomyidae				
Ctenomys		Tuco-tucos	3	Least Risk
Family		Abrocomidae		
Abrocoma		Chinchilla Rats	3	Least Risk
Family Echimyidae				
Proechimys	)			
Hoplomys	)			
Euryzygomatomys	)			
Clyomys	)			
Carterodon	)			
Cercomys	)			
Mesomys	)–	American Spiny Rats	3	Least Risk
Lonchothrix	)			
Isothrix	)			
Diplomys	)			
Echimys	)			
Dactylomys	)			
Kannabateomys	)			
Thrinacodus	)			
Family Thryonomyidae				
Thryonomys		Cane Rats	3	Least Risk
Family Petromyidae				
Petromus		Rock Rat	3	Least Risk
Family Bathyergidae				
Georychus	)			
Cryptomys	)			
Heliophobius	)–	Mole-rats	3	Least Risk
Bathyergus	)			
Heterocephalus	)			
Family Ctenodactylidae				
Ctenodactylus	)			
Pectinator	)–	Gundis	3	Least Risk
Massoutiera	)			
Felovia	)			

Order CARNIVORA			
Family Canidae			
Canis (wild species only)			
C. lupus	Wolf	1	Greater Risk
C. species	Coyote, Jackals	2	Less Risk
Alopex	Arctic Fox	2	Less Risk
Vulpes	Common Foxes	2	Less Risk
Dusicyon	South American Foxes	2	Less Risk
Nyctereutes	Raccoon Dog	2	Less Risk
Chrysocyon	Maned Wolf	2	Less Risk
Speothos	Bush Dog	2	Less Risk
Cuon	Dhole	2	Less Risk
Lycaon	Hunting Dog	1	Greater Risk
0tocyon	Bat-eared Fox	2	Less Risk
Family Ursidae			
Tremarctos	Spectacled Bear	1	Greater Risk
Selenarctos	Asiatic Black Bear	1	Greater Risk
Ursus	Brown and American Black Bears	1	Greater Risk
Thalarctos	Polar Bear	1	Greater Risk
Helarctos	Sun Bear	1	Greater Risk
Melursus	Sloth Bear	1	Greater Risk
Family Procyonidae			
Bassariscus	Cacomistles	2	Less Risk
Procyon	Raccoons	2	Less Risk
Nasua	Coatis	2	Less Risk
Nasuella	Mountain Coati	2	Less Risk
Potos	Kinkajou	2	Less Risk
Bassaricyon	0lingo	2	Less Risk
Family Ailuropodidae			
Ailurus	Red Panda	2	Less Risk
Ailuropoda	Giant Panda	1	Greater Risk
Family Mustelidae			
Sub-family Mustelinae			
Mustela	Minks, Stoats, Weasels	2	Less Risk
Vormela	Marbled Polecat	2	Less Risk
Martes	Martens	2	Less Risk
Eira	Tayra	2	Less Risk
Galictis	Grison	2	Less Risk
Lyncodon	Patagonian Weasel	2	Less Risk
Ictonyx	Zorilla	2	Less Risk
Poecilictis	Libyan Weasel	2	Less Risk
Poecilogale	White-naped Weasel	2	Less Risk
Gulo	Wolverine or Glutton	1	Greater Risk
Mellivora	Ratel	1	Greater Risk

Sub-family Mustelinae *continued*			
Meles	Badger	2	Less Risk
Arctonyx	Hog Badger	2	Less Risk
Mydaus	Malay Badger	2	Less Risk
Taxidea	American Badger	2	Less Risk
Melogale	Ferret Badgers	2	Less Risk
Mephitis	Skunks	2	Less Risk
Spilogale	Spotted Skunks	2	Less Risk
Conepatus	Hog-nosed and South American Skunks	2	Less Risk
Sub-family Lutrinae			
Lutra	Otters	1	Greater Risk
Pteronura	Giant Otter	1	Greater Risk
Aonyx	Small-toothed Otters	1	Greater Risk
Enhydra	Sea Otters	1	Greater Risk
Family Viverridae			
Poiana	African Linsang	2	Less Risk
Genetta	Genets	2	Less Risk
Viverricula	Small Indian Civet	2	Less Risk
0sbornictis	Water Civet	2	Less Risk
Viverra	Civets	2	Less Risk
Prionodon	Asiatic Linsangs	2	Less Risk
Nandinia	African Palm Civet	2	Less Risk
Arctogalidea	Small-toothed Palm Civet	2	Less Risk
Paradoxurus	Palm Civets	2	Less Risk
Paguma	Masked Palm Civets	2	Less Risk
Macrogalidea	Brown Palm Civet	2	Less Risk
Arctictis	Binturong	2	Less Risk
Fossa	Malagasy Civet	2	Less Risk
Hemigalus	Banded Palm Civets	2	Less Risk
Chrotogale	Owston's Civet	2	Less Risk
Cynogale	Otter Civet	2	Less Risk
Eupleres	Falanoucs	2	Less Risk
Galidea	Malagasy Mongoose	2	Less Risk
Galidictis	Malagasy Mongooses	2	Less Risk
Mungotictis	Malagasy Mongooses	2	Less Risk
Salanoia	Malagasy Mongooses	2	Less Risk
Suricata	Meerkat or Suricate	2	Less Risk
Herpestes	Mongooses	2	Less Risk
Helogale	Dwarf Mongooses	2	Less Risk
Dologale	Dwarf Mongooses	2	Less Risk
Atilax	Marsh Mongoose	2	Less Risk
Mungos	Banded Mongooses	2	Less Risk

Family Viverridae *continued*			
Crossarchus	Kusimanse	2	Less Risk
Liberiictis	Kuhn's Kusimanse	2	Less Risk
Ichneumia	White-tailed Mongoose	2	Less Risk
Bdeogale	Mongooses	2	Less Risk
Rhynchogale	Mongooses	2	Less Risk
Cynictis	Mongooses	2	Less Risk
Paracynictis	Selous' Meerkat	2	Less Risk
Cryptoprocta	Fossa	2	Less Risk
Family Hyaenidae			
Proteles	Aardwolf	3	Least Risk
Crocuta	Spotted Hyaena	1	Greater Risk
Hyaena	Hyaenas	1	Greater Risk
Family Felidae			
Felis			
F. concolor	Puma	1	Greater Risk
F. species (wild species)	Wild Cats, Lynxes	1	Greater Risk
Panthera	Lion, Tiger, Leopard Jaguar	1	Greater Risk
Neofelis	Clouded Leopard	1	Greater Risk
Acinonyx	Cheetah	1	Greater Risk
Order PINNIPEDIA			
Family 0tariidae			
Arctocephalus	Fur Seals	1	Greater Risk
Callorhinus	Northern Fur Seal	1	Greater Risk
Zalophus	California Sealion	1	Greater Risk
Eumetopias	Steller's Sealion	1	Greater Risk
0taria	Southern Sealion	1	Greater Risk
Neophoca	Australian Sealion	1	Greater Risk
Family Odobenidae			
Odobenus	Walrus	1	Greater Risk
Family Phocidae			
Phoca	Common, Ringed, Caspian & Baikal Seal	1	Greater Risk
Histriophoca	Ribbon Seal	1	Greater Risk
Pagophilus	Harp Seal	*1*	*Greater* Risk
Halichoerus	Grey Seal	*1*	*Greater* Risk
Erignathus	Bearded Seal	*1*	*Greater* Risk
Lobodon	Crab-eating Seal	*1*	*Greater* Risk
Ommatophoca	Ross Seal	*1*	*Greater* Risk
Hydrurga	Leopard Seal	1	Greater Risk
Leptonychotes	Weddell Seal	1	Greater Risk
Monachus	Monk Seals	*1*	*Greater* Risk
Mirounga	Elephant Seals	1	Greater Risk
Cystophora	Hooded Seal	1	Greater Risk

Order TUBULIDENTATA			
Family 0rycteropidae			
Orycteropus	Aardvark	2	Less Risk
Order HYRACOIDEA			
Family Procaviidae			
Dendrohyrax	Tree Hyrax	2	Less Risk
Heterohyrax	Rock Hyrax	2	Less Risk
Procavia	Rock Hyrax	2	Less Risk
Order PROBOSCOIDEA			
Family Elephantidae			
Loxodonta	African Elephant	1	Greater Risk
Elephas	Asian Elephant	1	Greater Risk
Order SIRENIA			
Family Dugongidae			
Dugong	Dugongs	3	Least Risk
Family Trichechidae			
Trichechus	Manatees	3	Least Risk
Order PERISSODACTYLA			
Family Equidae			
Equus (wild species)	Wild Horses, Asses and Zebras	1	Greater Risk
Family Tapiridae			
Tapirus	Tapirs	2	Less Risk
Family Rhinocerotidae			
Rhinoceros	Asiatic Rhinoceroses	1	Greater Risk
Dicerorhinus	Sumatran Rhinoceros	2	Less Risk
Ceratotherium	White Rhinoceros	1	Greater Risk
Diceros	Black Rhinoceros	1	Greater Risk
Order ARTIODACTYLA			
Family Suidae			
Potamochaerus	Bush Pig	1	Greater Risk
Sus (wild species)	Wild Boar	1	Greater Risk
Phacochoerus	Wart Hog	1	Greater Risk
Hylochoerus	Giant Forest Hog	1	Greater Risk
Babirousa	Babirusa	1	Greater Risk
Family Tayassuidae			
Tayassu	Peccaries	1	Greater Risk
Catagonus	Chaco Peccary	1	Greater Risk
Family Hippopotamidae			
Hippopotamus	Hippopotamus	1	Greater Risk
Choeropsis	Pygmy Hippopotamus	1	Greater Risk

Family Camelidae			
Lama			
L. guanicoe	Guanaco	2	Less Risk
L. glama	Llama	2	Less Risk
L. pacos	Alpaca	2	Less Risk
Vicugna	Vicuna	2	Less Risk
Camelus	Camels	1	Greater Risk
Family Tragulidae			
Hyemoschus	Water Chevrotain)–	3	Least Risk
Tragulus	Chevrotains)		
Family Moschidae			
Moschus	Musk Deer	3	Least Risk
Family Cervidae			
Hydropotes	Chinese Water Deer	3	Least Risk
Muntiacus	Muntjaks	3	Least Risk
Elaphodus	Tufted Deer	3	Least Risk
Cervus			
(larger species)	Red Deer, Wapiti, Sika Deer	1	Special Confined Risk
(other species)	Fallow Deer, etc.		
	(adult males)	1	Special Confined Risk
	(females and young)	2	Less Risk
Elaphurus	Pere David's Deer	1	Greater Risk
Alces	Moose, European Elk	1	Greater Risk
Rangifer	Caribou, Reindeer (adult males)	1	Greater Risk
	(females and young)	2	Less Risk
0docoileus	Mule Deer, White-tailed Deer	2	Less Risk
Blastocerus	Marsh Deer	2	Less Risk
Ozotoceros	Pampas Deer	2	Less Risk
Hippocamelus	Guemals	2	Less Risk
Mazama	South American Brockets	2	Less Risk
Pudu	Pudu	3	Least Risk
Capreolus	Roe Deer (adult males)	1	Greater Risk
	(females and young)	2	Less Risk
Family Giraffidae			
Okapia	Okapi	2	Less Risk
Giraffa	Giraffe	1	Greater Risk
Family Antilocapridae			
Antilocapra	Pronghorn Antelope	2	Less Risk
Family Bovidae			
Tragelaphus			
T. angasi	Nyala (adult males)	1	Greater Risk
	(females and young)	2	Less Risk
T. buxtoni	Mountain Nyala (adult males)	1	Greater Risk
	(females & young)	2	Less Risk

Family Bovidae *continued*			
T. scriptus	Bushbuck (adult males)	1	Greater Risk
	(females and young)	2	Less Risk
T. spekei	Sitatunga (adult males)	1	Greater Risk
	(females and young)	2	Less Risk
T. oryx	Eland	1	Greater Risk
T. derbianus	Giant Eland	1	Greater Risk
T. strepsiceros	Greater Kudu (adult males)	1	Greater Risk
	(females and young)	2	Less Risk
T. imberbis	Lesser Kudu (adult males)	1	Greater Risk
	(females and young)	2	Less Risk
T. euryceros	Bongo (adult males)	1	Greater Risk
	(females and young)	2	Less Risk
Boselaphus	Nilghai	2	Less Risk
Tetracerus	Four-horned Antelope	2	Less Risk
Bubalus	Anoas, Tamarau, Water Buffalo	1	Greater Risk
Bos (wild and larger exotic domestic species)			
	Ankole, Banteng, Gaur,		
	Yak (adult males)	1	Greater Risk
	others	2	Less Risk
Synceros	African Buffalo	1	Greater Risk
Bison	American Bison, Wisent	1	Greater Risk
Kobus			
K. ellipsiprymnus	Common Waterbuck (adult males)	1	Greater Risk
	(females & young)	2	Less Risk
K. defassa	Defassa Waterbuck (adult males)	1	Greater Risk
	(females & young)	2	Less Risk
K. kob	Kob (adult males)	1	Greater Risk
	(females & young)	2	Less Risk
K. leche	Red Lechwe (adult males)	1	Greater Risk
	(females & young)	2	Less Risk
K. megaceros	Nile Lechwe (adult males)	1	Greater Risk
	(females and young)	2	Less Risk
K. vardoni	Puku	2	Less Risk
Cephalophus	Duikers	2	Less Risk
Sylvicapra	Common Duiker	2	Less Risk
Redunca	Reedbuck	2	Less Risk
Pelea	Rhebok	2	Less Risk
Hippotragus			
H. niger	Sable Antelope (adult males)	1	Greater Risk
	(females and young)	2	Less Risk
H. equinus	Roan Antelope (adult males)	1	Greater Risk
	(females and young)	2	Less Risk
Oryx	Oryxes and Gemsbok	1	Greater Risk

Family Bovidae *continued*			
Addax	Addax	2	Less Risk
Connochaetes	Wildebeests or Gnus	1	Greater Risk
Alcephus	Hartebeests	2	Less Risk
Damaliscus	Bontebok, Blesbok, Topi, & Hunter's Hartebeest	2	Less Risk
0reotragus	Klipspringer	3	Least Risk
Madoqua	Dik-diks	3	Least Risk
Dorcatragus	Beira Antelope	3	Least Risk
Ourebia	Oribi	3	Least Risk
Raphiceros	Steenbok and Gry-sbok	3	Least Risk
Neotragus	Dwarf Antelope, Suni & Royal Antelope	3	Least Risk
Aepyceros	Impala	2	Less Risk
Antilope	Blackbuck	2	Less Risk
Antidorcas	Springbok	2	Less Risk
Litocranius	Gerenuk	2	Less Risk
Ammodorcas	Dibatag	2	Less Risk
Gazella	Gazelles	2	Less Risk
Procapra	Chinese Gazelles	2	Less Risk
Pantholops	Tibetan Antelope or Chiru	2	Less Risk
Saiga	Saiga	2	Less Risk
Nemorhaedus	Gorals	2	Less Risk
Capricornis	Serows	2	Less Risk
Oreamnos	Rocky Mountain Goat	2	Less Risk
Rupicapra	Chamois	2	Less Risk
0vibos	Musk Ox	1	Greater Risk
Budorcas	Takins	2	Less Risk
Hemitragus	Tahr (adult males)	1	Greater Risk
	(females and young)	2	Less Risk
Capra (wild species)			
Tur, Markhor, Ibex, Wild Goats			
	(adult males)	1	Greater Risk
	(females and young)	2	Less Risk
Ammotragus	Aoudad or Barbary Sheep	1	Greater Risk
Pseudois	Bharal	2	Less Risk
Ovis	(large wild species) Argali, Bighorns	1	Greater Risk
	(small wild species) Mouflon, Urials	2	Less Risk
Family Platanistidae			
Pontoporia	La Plata River Dolphin	3	Least Risk
Inia	Amazon River Dolphin or Boutu	3	Least Risk
Lipotes	White-flag or Yangtze River Dolphin	3	Least Risk
Platanista	Indian River Dolphins	3	Least Risk

Family Delphinidae			
Steno	Rough-toothed Dolphin	3	Least Risk
Sotalia	Tucuxi Dolphin	3	Least Risk
Sousa	Hump-backed Dolphins	3	Least Risk
Stenella	Striped and Spinner Dolphins	3	Least Risk
Delphinus	Common Dolphin	3	Least Risk
Tursiops	Bottle-nosed Dolphins	3	Least Risk
Lissodelphis	Right-whale Dolphins	3	Least Risk
Lagenodelphis	Fraser's Dolphin	3	Least Risk
Lagenorhynchus	White-sided Dolphins	3	Least Risk
Peponocephala	Melon-headed Dolphin	3	Least Risk
Cephalorhynchus	Piebald Dolphins	3	Least Risk
0rcaella	lrrawaddy River Dolphin	3	Least Risk
Pseudorca	False Killer Whale	1	Greater Risk
Orcinus	Killer Whale	1	Greater Risk
Grampus	Risso's Dolphin	2	Less Risk
Globicephala	Pilot Whales	2	Less Risk
Feresa	Pygmy Killer Whale	1	Greater Risk
Family Phocoenidae			
Phocoena	Common Porpoises	3	Least Risk
Phocoenoides	Dall's Porpoise	3	Least Risk
Neophocoena	Finless Porpoise	3	Least Risk
Family Monodontidae			
Delphinapterus	White Whale	3	Least Risk
Monodon	Narwhal (adult males)	2	Less Risk
	(others)	3	Least Risk
Family Physeteridae			
Kogia	Pygmy Sperm Whales	2	Less Risk
Physeter	Sperm Whale		Outside the scope of this listing
Family Ziphiidae			
Tasmacetus	Tasman whale	2	Less Risk
Berardius	Arnoud's & Baird's Beaked Whales	2	Less Risk
Mesoplodon	Beaked Whales	2	Less Risk
Ziphius	Cuvier's Beaked Whale	2	Less Risk
Hyperoodon	Bottle-nosed Whales	2	Less Risk
Sub-order Mysticeti			
Family Eschrichtidae	Grey Whale	)	
Family Balaenopteridae	Rorquals and Humpback Whales	)–	Outside the scope of
Family Balaenidae	Right Whales and Bowhead	)	this listing
Class Aves			
Order STRUTHIONIFORMES			
Family Struthionidae			
Struthio	Ostrich	1	Greater Risk

Order RHEIFORMES				
Family Rheidae				
Rhea	Common Rhea		2	Less Risk
Pterocnemia	Darwin's Rhea		2	Less Risk
Order CASUARIIFORMES				
Family Casuariidae				
Casuarius	Cassowaries		1	Greater Risk
Family Dromaiidae				
Dromaius	Emu		2	Less Risk
Order APTERYGIFORMES				
Family Apterygidae	Kiwis		3	Least Risk
Order TINAMIFORMES				
Family Tinamidae	Tinamous		3	Least Risk
Order SPHENISCIFORMES				
Family Spheniscidae	Penguins		3	Least Risk
Order GAVIFORMES				
Family Gaviidae	Divers or Loons		3	Least Risk
Order PODICIPEDIFORMES				
Family Podicipedidae	Grebes		3	Least Risk
Order PROCELLARIFORMES				
Family Diomedeidae	Albatrosses	)		
Family Procellariidae	Fulmars, Petrels	)		
and Shearwaters		)–	3	Least Risk
Family Hydrobatidae	Storm Petrels	)		
Family Pelecanoididae	Diving Petrels	)		
Order PELICANIFORMES				
Family Phaethontidae	Tropic Birds		3	Least Risk
Family Pelecanidae				
Pelecanus				
P. conspicillatus	Australian Pelican		2	Less Risk
P. crispus	Dalmatian Pelican		2	Less Risk
P. erythrorhynchus	American White Pelican		2	Less Risk
P. occidentalis	Brown Pelican		2	Less Risk
P. onocrotalus	Great White Pelican		2	Less Risk
P. philippensis	Grey Pelican	)		
P. rufescens	Pink-backed Pelican	)		
Family Sulidae	Gannets and Boobies	)–	3	Least Risk
Family Phalacrocoracidae	Cormorants	)		
Family Anhingidae	Darters, Snake-Birds	)		
	or Anhingas	)		
Family Fregatidae	Frigate Birds	)		

Order CICONIIFORMES			
Family Ardeidae			
Ardea			
A. cinerea	Grey Heron	2	Special Pecking Risk
A. herodias	Great Blue Heron	2	Special Pecking Risk
	(includes Great White Heron)	2	Special Pecking Risk
A. purpurea	Purple Heron	2	Special Pecking Risk
A. goliath	Goliath Heron	2	Special Pecking Risk
A. imperialis	Great White-bellied Heron	2	Special Pecking Risk
A. spp	other *Ardea* species	3	Least Risk
Egretta			
E. alba	Large (Great) Egret	2	Less Risk
E. spp.	other *Egretta* species		
	(including *Hydronassa*))		
Butorides	Green, Rufous-bellied)		
	& Striated Herons)		
Ardeola	Pond and Squacco Herons)		
Bubulcus	Cattle Egret)		
Agamia	Chestnut-bellied Heron)		
Pilherodius	Capped Heron)		
Syrigma	Whistling Heron)		
Cochlearius	Boat-billed Heron)–	3	Least Risk
Nycticorax	Night-Herons)		
Gorsachius	Tiger-Bitterns)		
Zonerodius	Forest Bittern)		
Tigrisoma	Tiger-Herons)		
Zebrilus	Zigzag Heron)		
Ixobrychus	Little Bitterns)		
Botaurus	Bitterns)		
Dupetor	Black Bittern)		
Family Balaenicipitidae	Shoebill or Whalehead)–	3	Least Risk
Family Scopidae	Hammerhead or Hammerkop)		
Family Ciconiidae			
Mycteria	Wood Stork	2	Special Pecking Risk
Ibis	Painted Storks (NB not Ibises)	2	Special Pecking Risk
Anastomus	Open-bill Storks	2	Special Pecking Risk
Ciconia			
C. abdimii	White-bellied or Abdim's Stork	3	Least Risk
C. ciconia	White Stork	2	Special Pecking Risk
C. episcopus	White-necked Stork	2	Special Pecking Risk
C. nigra	Black Stork	2	Special Pecking Risk
Euxenura	Maguari Stork	2	Special Pecking Risk
Xenorhynchus	Black-necked Stork	2	Special Pecking Risk
Ephippiorhynchus	Saddle-bill Stork	2	Special Pecking Risk

Family Ciconiidae *continued*			
Jabiru	Jabiru	2	Special Pecking Risk
Leptoptilos	Marabou and Adjutant Storks	2	Special Pecking Risk
Family Threskiornithidae	Ibises and Spoonbills	3	Least Risk
Family Phoenicopteridae	Flamingoes	3	Least Risk
Order ANSERIFORMES			
Family Anhimidae	Screamers)–	3	Least Risk
Family Anatidae	Geese, Swans and Ducks)		
Order FALCONIFORMES			
Family Cathartidae			
Cathartes	Turkey & Yellow-headed Vultures	2	Less Risk
Coragyps	Black Vulture	2	Less Risk
Sarcorhamphus	King Vulture	2	Less Risk
Vultur	Andean Condor	1	Greater Risk
Gymnogyps	Californian Condor	1	Greater Risk
Family Pandionidae			
Pandion	Osprey	2	Less Risk
Family Accipitridae			
Spilornis	Serpent Eagles	2	Less Risk
Aviceda	Cuckoo Falcons & Lizard Hawks	2	Less Risk
Leptodon	Gray-Headed Kite	2	Less Risk
Chondrohierax	Hook-billed Kite	2	Less Risk
Henicopernis	Long-tail & Black Honey Buzzards	2	Less Risk
Pernis	Honey Buzzards	2	Less Risk
Elanoides	Swallow-tailed Kite	2	Less Risk
Macheirhamphus	Bat Hawk	2	Less Risk
Gampsonyx	Pearl Kite	2	Less Risk
Elanus	Kites	2	Less Risk
Rostrhamus	Kites	2	Less Risk
Harpagus	Kites	2	Less Risk
Ictinia	Kites	2	Less Risk
Lophoictinia	Square-tailed Kite	2	Less Risk
Hamirostra	Black-breasted Buzzard	2	Less Risk
Milvus	Black & Red Kites	2	Less Risk
Haliastur	Brahminy & Whistling Kites	2	Less Risk
Haliaeetus	Bald, Sea & Fish Eagles	2	Less Risk
Ichthyophaga	Grey-headed Fishing Eagle	2	Less Risk
Gypohierax	Palm-nut Vulture	2	Less Risk
Neophron	Hooded & Egyptian Vultures	2	Less Risk
Gypaetus	Bearded Vulture	2	Less Risk
Gyps	Vultures and Griffon Vultures	2	Less Risk
Sarcogyps	Indian Black Vulture	2	Less Risk
Aegypius	European Black & Lappet-faced Vultures	2	Less Risk
Trigonoceps	White-headed Vulture	2	Less Risk

Family Accipitridae *continued*			
Circaetus	Snake Eagles	2	Less Risk
Terathopius	Bateleur	2	Less Risk
Dryotriorchis	Congo Snake Eagle	2	Less Risk
Eutriorchis	Madagascar Serpent Eagle	2	Less Risk
Polyboroides	African Harrier Hawk	2	Less Risk
Geranospiza	Crane Hawk	2	Less Risk
Circus	Harriers	2	Less Risk
Melierax	Chanting Goshawks	2	Less Risk
Megatriorchis	Doria's Hawk	2	Less Risk
Erythrotriorchis	Red Goshawk	2	Less Risk
Accipiter	Hawks, Sparrow Hawks & Goshawks	2	Less Risk
Urotriorchis	African Long-tailed Hawk	2	Less Risk
Butastur	Grey-faced Buzzard-Eagle	2	Less Risk
Kaupifalco	Lizard Buzzard	2	Less Risk
Leucopternis	Hawks	2	Less Risk
Buteogallus	Hawks	2	Less Risk
Harpyhaliaetus	Solitary Eagle	2	Less Risk
Heterospizias	Savannah Hawk	2	Less Risk
Busarellus	Black-collared Hawk	2	Less Risk
Geranoaetus	Black-chested Buzzard-Eagle	2	Less Risk
Parabuteo	Harris Hawk	2	Less Risk
Buteo	Buzzards	2	Less Risk
Morphnus	Crested Eagle	2	Less Risk
Harpia	Harpy Eagle	1	Greater Risk
Harpyopsis	New Guinea Harpy Eagle	1	Greater Risk
Pithecophaga	Monkey-eating Eagle	1	Greater Risk
Ictinaetus	Black Eagle	2	Less Risk
Aquila	Eagles	2	Less Risk
Hieraaetus	Eagles	2	Less Risk
Spizastur	Black-and-white Hawk-Eagle	2	Less Risk
Lophaetus	Long-crested Eagle	2	Less Risk
Spizaetus	Hawk-Eagles	2	Less Risk
Stephanoaetus	Crowned Eagle	2	Less Risk
Oroaetus	Black-and-Chestnut Eagle	2	Less Risk
Polemaetus	Martial Eagle	1	Greater Risk
Family Sagittariidae			
Sagittarius	Secretary Bird	2	Less Risk
Family Falconidae			
Daptrius	Caracaras	2	Special Pecking Risk
Phalcoboenus	Caracaras	2	Special Pecking Risk
Polyborus	Crested Caracara	2	Special Pecking Risk
Milvago	Milvago Caracaras	2	Special Pecking Risk
Herpetotheres	Laughing Falcon	2	Less Risk

Family Falconidae *continued*				
Micrastur	Forest Falcons		2	Less Risk
Spiziapteryx	Spot-winged Falconet	)		
Polihierax	African Pygmy Falcon	)–	3	Least Risk
Microhierax	Falconets	)		
Falco	Kestrels and Falcons		2	Less Risk
Order GALLIFORMES				
Family Megapodidae	Megapodes		3	Least Risk
Family Cracidae				
Ortalis	Chachalacas	)		
Penelopina	Black Chachalaca	)		
Penelope	Guans	)		
Aburria	Wattled & Piping Guans	)		
Chamaepetes	Sickle-winged & Black Guans	)–	3	Least Risk
Oreophasis	Horned Guan	)		
Nothothrax	Nocturnal Curassow	)		
Crax	Curassows	)		
Family Tetraonidae	Grouse	)		
Family Phasianidae	Partridges, Pheasants & Quails	)		
Family Numididae	Guineafowl	)–	3	Least Risk
Family Meleagrididae	Turkeys	)		
Family Opisthocomidae	Hoatzin	)		
Order GRUIIFORMES				
Family Mesitornithidae Mesites		)		
Family Turnicidae	Buttonquails & Hemipodes	)–	3	Least Risk
Family Pedionomidae	Plains Wanderer	)		
Family Gruidae				
Grus	Cranes		2	Special Pecking Risk
Anthropoides	Blue & Demoiselle Cranes		2	Special Pecking Risk
Balearica	Crowned Crane		2	Special Pecking Risk
Family Aramidae	Limpkin	)		
Family Psophiidae	Trumpeters	)–	3	Least Risk
Family Rallidae	Rails, Crakes, Coots	)		
	& Gallinules	)		
Family Heliornithidae	Finfoots and Sungrebes		3	Least Risk
Family Rhynochetidae	Kagu		3	Least Risk
Family Eurypigidae	Sunbittern		3	Least Risk
Family Cariamidae	Seriemas		3	Least Risk
Family Otidae				
Otis	Great and Little Bustards	)–	3	Least Risk
Neotis	Bustards	)		
Ardeotis	Kori and Large Bustards		2	Less Risk
Chlamydotis	Houbara Bustard		2	Less Risk
Eupodotis	Bustards	)–	3	Least Risk

Family Otidae *continued*				
Sypheotides	Lesser Florican	)		
Order CHARADRIFORMES				
Family Jacanidae	Jacanas	)		
Family Rostratulidae	Painted Snipe	)		
Family Haematopodidae	Oystercatchers	)		
Family Charadriidae	Plovers	)		
Family Scolopacidae	Wading Birds (Snipe, Woodcock, & Sandpipers	))–	3	Least Risk
Family Recurvirostridae	Avocets	)		
Family Dromadidae	Crab Plover	)		
Family Burhinidae	Thick-knees	)		
Family Glareolidae	Coursers and Pratincoles	)		
Family Thinocoridae	Seedsnipe	)		
Family Chionididae	Sheathbills	)		
Family Stercorariidae	Skuas		2	Less Risk
Family Laridae	Gulls and Terns	)		
Family Rhynchopidae	Skimmers	)–	3	Least Risk
Family Alcidae	Auks	)		
Order COLUMBIFORMES				
Family Pteroclidae	Sandgrouse	)–	3	Least Risk
Family Columbidae	Pigeons and Doves	)		
Order PSITTACIFORMES				
Family Psittacidae				
Chalcopsitta	Lories	)		
Eos	Lories	)		
Pseudeos	Dusky Lory	)–	3	Least Risk
Trichoglossus	Lorikeets and Lories	)		
Lorius	Lories	)		
Phigys	Collared Lory	)		
Vini	Lories	)		
Glossopsitta	Lorikeets	)		
Charmosyna	Lorikeets & Lories	)–	3	Least Risk
Oreopsittacus	Whiskered Lorikeet	)		
Neopsittacus	Lorikeets	)		
Probosciger	Palm Cockatoo		2	Less Risk
Calaptorhynchus	Cockatoos		2	Less Risk
Callocephalon	Gang-gang Cockatoo	)		
Eolophus	Galah	)–	3	Least Risk
Cacatua	Cockatoos and Corellas	)		
Nymphicus	Cockatiel	)		
Nestor	Kaka & Kea		2	Less Risk
Micropsitta	Pygmy Parrots	)		
Opopsitta	Fig Parrots	)		

Family Psittacidae *continued*

Psittaculirostris	Fig Parrots	)		
Bolbopsittacus	Guaiabero	)		
Psittinus	Blue-rumped Parrot	)		
Psittacella	Parrots	)		
Geoffroyus	Parrots	)		
Prioniturus	Racket-tailed Parrot	)		
Tanygnathus	Parrots	)		
Eclectus	Eclectus Parrots	)		
Psittrichas	Pesquet's Parrot	)		
Prosopeia	Shining Parrots	)		
Alisterus	King Parrots	)–	3	Least Risk
Aprosmictus	Red-winged Parrots	)		
Polytelis	Parrots	)		
Purpureicephalus	Red-capped Parrot	)		
Barnardius	Parrots	)		
Platycercus	Rosellas	)		
Psephotus	Parrots	)		
Cyanorhamphus	Parakeets	)		
Eunymphicus	Horned Parakeet	)		
Neophema	Parrots	)		
Lathamus	Swift Parrot	)		
Melopsittacus	Budgerigar	)		
Pezoporus	Ground Parrot	)		
Geopsittacus	Night Parrot	)		
Strigops	Kakapo		2	Less Risk
Coracopsis	Vasa Parrots		3	Least Risk
Psittacus	African Gray Parrot		2	Less Risk
Poicephalus	Parrots	)		
Agapornis	Lovebirds	)–	3	Least Risk
Loriculus	Hanging Parrots	)		
Psittacula	Parakeets	)		
Anodorhynchus	Hyacinthine & Indigo Macaws		2	Less Risk
Cyanopsitta	Little Blue Macaw		2	Less Risk
Ara	Macaws		2	Less Risk
Aratinga	Parakeets	)		
Nandayus	Black-hooded Parrot	)		
Leptosittaca	Golden-plumed Parrot	)–	3	Least Risk
Rhynchopsitta	Thick-billed Parrot	)		
Cyanoliseus	Burrowing Parrot	)		
Ognorhynchus	Yellow-eared Parakeet	)		
Pyrrhura	Parakeets	)		
Enicognathus	Slenderbill & Austral Parakeets	)		
Miopsitta	Monk Parakeet	)		

Family Psittacidae *continued*				
Bolborhynchus	Parakeets	)		
Forpus	Parrotlets	)		
Brotogeris	Parakeets	)		
Nannopsittaca	Tepui Parrot	)–	3	Least Risk
Touit	Parrotlets	)		
Pionites	Parrots	)		
Gypopsitta	Vulturine Parrot	)		
Hapalopsittaca	Parrots	)		
Graydidascalus	Short-tail Parrot	)		
Pionus	Parrots	)		
Amazona	Amazon Parrots		2	Less Risk
Deroptyus	Red-fan Parrot	)–	3	Least Risk
Triclaria	Blue-bellied Parrot	)		
Order CUCULIFORMES				
Family Musophagidae	Turacos, Plaintain-eaters	)–	3	Least Risk
Family Cuculidae	Cuckoos	)		
Order STRIGIFORMES				
Family Tytonidae				
Tyto	Barn Owls		2	Less Risk
Pholidus	Bay Owls		2	Less Risk
Family Strigidae				
Otus	Scops-Owls and Screech-Owls	)–	3	Least Risk
Lophostrix	Crested Owl and Akun Scops-Owl	)		
Bubo	Eagle-Owls: adults which are breeding or rearing young		1	Greater Risk
	other adults		2	Less Risk
Ketupa	Fish Owls		2	Less Risk
Scotopelia	Fishing Owls		2	Less Risk
Pulsatrix	Owls		2	Less Risk
Sceloglaux	Laughing Owl		2	Less Risk
Nyctea	Snowy Owl		2	Less Risk
Surnia	Hawk-Owl		2	Less Risk
Glaucidium	Owlets and Pygmy Owls	)–	3	Least Risk
Micrathene	Elf Owl	)		
Uroglaux	Papuan Hawk-Owl	)		
Ninox	Booboks & Hawk-Owls	)		
Athene	Little & Burrowing Owls	)		
Ciccaba	Owls	)		
Strix	Owls	)–	2	Less Risk
Rhinoptynx	Striped Owl	)		
Asio	Owls	)		
Pseudoscops	Jamaican Owl	)		
Nesasio	Fearful Owl	)		
Aegolius	Whet-Owls	)		

Family Steatornithidae	Oilbird	)		
Family Podargidae	Frogmouths	)		
Family Nyctibiidae	Potos	)–	3	Least Risk
Family Aegothelidae	Owlet Nightjars)			
Family Caprimulgidae	Nightjars	)		
Order APODIFORMES				
Family Apodidae	Swifts	)		
Family Hemiprocnidae	Tree Swifts	)–	3	Least Risk
Family Trochilidae	Hummingbirds	)		
Order COLIIFORMES				
Family Coliidae	Colies or Mousebirds		3	Least Risk
Order TROGONIFORMES				
Family Trogonidae	Trogons		3	Least Risk
Order CORACIIFORMES				
Family Alcedinidae	Kingfishers	)		
Family Todidae	Todies	)		
Family Momotidae	Motmots	)		
Family Meropidae	Bee-eaters	)		
Family Leptosomatidae	Cuckoo Roller	)–	3	Least Risk
Family Brachypteraciidae	Ground Rollers	)		
Family Coraciidae	Rollers	)		
Family Upupidae	Hoopoes	)		
Family Phoeniculidae	Wood Hoopoes	)		
Family Bucerotidae				
Tockus	Hornbills		2	Less Risk
Berenicornis	White-crested Hornbills		2	Less Risk
Ptilolaemus	White-throated Brown Hornbill		2	Less Risk
Anorrhinus	Bushy-crested Hornbill		2	Less Risk
Penelopides	Hornbills		2	Less Risk
Aceros	Hornbills		2	Less Risk
Anthracoceros	Hornbills		2	Less Risk
Bycanistes	Hornbills		2	Less Risk
Ceratogymna	Black-casqued and Yellow-casqued Hornbills		2	Less Risk
Buceros	Hornbill		2	Less Risk
Rhinoplax	Helmeted Hornbill		2	Less Risk
Bucorvus	Ground Hornbills		1	Greater Risk
Order PICIFORMES				
Family Galbulidae	Jacamars	)		
Family Bucconidae	Puffbirds	)		
Family Capitonidae	Barbets	)		
Family Indicatoridae	Honeyguides	)–	3	(Least Risk)
Family Ramphastidae	Toucans	)		
Family Picidae	Woodpeckers	)		

Order PASSERIFORMES				
Sub-order Eurylaimi				
Family Eurylaimidae	Broadbills		3	Least Risk
Sub-order Tyranni				
Family Dendrocolaptidae	Woodcreepers	)		
Family Furnariidae	Ovenbirds	)		
Family Formicariidae	Antbirds	)		
Family Conopophagidae	Gnateaters	)		
Family Rhinocryptidae	Tapaculos	)–	3	Least Risk
Family Cotingidae	Cotingas	)		
Family Pipridae	Manakins	)		
Family Tyrannidae	Tyrant Flycatchers	)		
Family 0xyruncidae	Sharpbill	)		
Family Phytotomidae	Plantcutters	)		
Family Pittidae	Pittas	)		
Family Xenicidae (Acanthisittidae)	New Zealand Wrens	)		
Family Philepittidae	Asities & False Sunbirds	)		
Sub-order Menurai				
Family Menuridae	Lyrebirds	)–	3	Least Risk
Family Atrichornithidae	Scrub Birds	)		
Sub-order Passeres				
Family Alaudidae	Larks	)		
Family Hirundinidae	Swallows and Martins	)		
Family Motacillidae	Wagtails and Pipits	)		
Family Campephagidae	Cuckoo Shrikes & Minivets)			
Family Pycnonotidae	Bulbuls	)		
Family Irenidae	Leafbirds & Fairy Bluebirds	)		
Family Laniidae	Shrikes	)		
Family Vangidae	Vangas	)		
Family Bombycillidae	Waxwings, Silky Flycatchers & *Hypocolius*	))–	3	Least Risk
Family Dulidae	Palm Chat	)		
Family Cinclidae	Dippers	)		
Family Troglodytidae	Wrens	)		
Family Mimidae	Mockingbirds	)		
Family Prunellidae	Accentors	)		
Family Turdidae	Thrushes and Chats	)		
Family Timaliidae	Babblers	)		
Family Chamaeidae	Wrentit	)		
Family Paradoxornithidae	Parrotbills	)		
Family Picathartidae	Bald Crows or Picathartes)			
Family Polioptilidae	Gnatcatchers	)		
Family Sylviidae	Old World Warblers	)		

Family Regulidae	Kinglets and Tit-Warblers)			
Family Maluridae	Australian Wrens	)		
Family Ephthianuridae	Australian Chats	)		
Family Acanthizidae	Australian Warblers	)		
Family Muscicapidae	Old World Flycatchers and Thick-heads	))		
Family Aegithalidae	Long-tailed Tits	)		
Family Remizidae	Penduline Tits	)		
Family Paridae	Titmice	)		
Family Hypositttidae	Coral-billed Nuthatch	)		
Family Daphoenosittidae	Sitellas or Treerunners)			
Family Tichodromadidae	Wallcreeper	)		
Family Sittidae	Nuthatches	)		
Family Certhiidae	Treecreepers	)		
Family Salpornithidae	Spotted Creepers	)		
Family Rhabdornithidae	Philippine Creepers	)		
Family Climacteridae	Australian Treecreepers)			
Family Dicaeidae	Flowerpeckers	)		
Family Zosteropidae	White-eyes	)		
Family Nectariniidae	Sunbirds	)		
Family Promeropidae	Sugarbirds	)		
Family Meliphagidae	Honeyeaters	)		
Family Emberizidae	Buntings, American Sparrows, & Juncos	)–)	3	Least Risk
Family Catamblyrhynchidae	Plush-capped Finch	)		
Family Cardinalidae	Cardinal Grosbeaks	)		
Family Thraupidae	Tanagers	)		
Family Tersinidae	Swallow Tanager	)		
Family Vireonidae	Vireos	)		
Family Parulidae	New World Warblers	)		
Family Drepanididae	Hawaiian Honeycreepers	)		
Family Icteridae	Icterids	)		
Family Fringillidae	Finches	)		
Family Estrildidae	Waxbills & Manninkins	)		
Family Ploceidae	Sparrows, Weavers, Whydahs & Indigo-Birds	))		
Family Sturnidae	Starlings	)		
Family Oriolidae	Orioles	)		
Family Dicruridae	Drongos	)		
Family Callaeidae	Wattlebirds	)		
Family Grallinidae	Mudnest-Builders	)		
Family Artamidae	Wood Swallows	)		
Family Cracticidae	Butcherbirds & Currawongs	))		
Family Ptilonorhynchidae	Bowerbirds	)		

Family Paradisaeidae	Bird of Paradise	)		
Family Corvidae				
Platylophus	Crested Malay Jay	)		
Platysmurus	Black-crested Magpie	)		
Gymnorhinus	Pinon Jay	)		
Cyanocitta	Blue and Steller's Jays	)		
Aphelocoma	Jays	)		
Cyanolyca	Jays	)		
Cissilopha	Jays	)–	3	Least Risk
Cyanocorax	Jays	)		
Psilorhinus	Brown Jay	)		
Calocitta	Magpie-Jay	)		
Garrulus	Jays	)		
Perisoreus	Gray Jays	)		
Urocissa	Blue Magpies	)		
Cissa	Green Magpies	)		
Cyanopica	Azure-winged Magpie	)		
Dendrocitta	Tree-pie	)		
Crypsirina	Tree-pie	)		
Temnurus	Tree-pie	)		
Pica	Magpie	)		
Zavattariornis	Bush Crow	)		
Podoces	Ground Jay	)–	3	Least Risk
Pseudopodeces	Ground Jay	)		
Nucifraga	Nutcrackers	)		
Pyrrhocorax	Chough	)		
Ptilostomus	Piapiac	)		
Corvus				
C. albicollis	African White-necked Raven		2	Less Risk
C. corax	Raven		2	Less Risk
C. coronoides	Australian Raven		2	Less Risk
C. crassirostris Thick-billed Raven			2	Less Risk
C. cryptoleucus	White-necked Raven		2	Less Risk
C. mellori	South Australian Raven		2	Less Risk
C. rhipidurus	Fan-tailed Raven		2	Less Risk
C. ruficollis	Brown-necked'Raven		2	Less Risk
C. spp	Jackdaws, Rook and Crows		3	Least Risk
Class Reptilia				
Order CHELONIA				
Family Pelomedusidae				
Pelomedusa	Helmeted Turtles	)		
Pelusios	Mud Turtles	)–	3	Least Risk
Podocnemis	Arrau	)		

Family Chelidae				
Chelus	Matamata		2	Less Risk
Batrachemys	Snake-necked Turtles		2	Less Risk
Hydromedusa	Otter Turtles	)		
Phrynops	Flat Turtles	)		
Mesoclemys	Amazon Turtle	)		
Platyemys	South American	)		
	Long-necked Turtle	–	3	Least Risk
Chelodina	Australian	)		
	Snake-necked Turtles	)		
Emydura	Murray River Turtle	)		
Elseya	Australian Snapping Turtles		2	Less Risk
Pseudemydura	Western Australian River Turtle		3	Least Risk
Family Chelydridae				
Chelydra	Snapping Turtle		1	Greater Risk
Macroclemys	Alligator Snapping Turtle		1	Greater Risk
Family Kinosternidae				
Sternotherus	Musk Turtle	)		
Kinosternon	Mud Turtle	)–	3	Least Risk
Claudius	Narrow-bridged Mud Turtle	)		
Staurotypus	Giant Musk Turtle	)		
Family Dermatemyidae				
Dermatemys	Mexican River Turtle		3	Least Risk
Family Platysternidae				
Platysternon	Big-headed Turtle		3	Least Risk
Family Emydidae				
Emys	European Pond Turtle	)		
Emydoidea	American Semi-box Turtle	)		
Deirochelys	Chicken Turtle	)		
Chrysemys	Cooters and Sliders	)		
Graptemys	Map Turtles	)		
Malaclemys	Diamond-backed Terrapin	)		
Terrapene	Box Turtles	)		
Clemmys	Spotted, Wood, Bog	)		
	and Pacific Pond Turtles	)		
Mauremys	Asiatic Terrapin	)		
Sacalia	Asiatic Terrapin	)–	3	Least Risk
Annamemys	Annam Turtle	)		
Cyclemys	Pond Turtle	)		
Geoclemys	Black Pond Turtle	)		
Chinemys	Reeve's Turtle	)		
0cadia	Chinese Pond Turtle	)		
Notochelys	Indochina Pond Turtle	)		
Siebenrockiella	Annandale's Turtle (=*Hieremys*)	)		
Morenia	Plant-eating Pond Turtles	)		

Cuora	Box Turtles	)		
Hardella	Diadem Turtle	)		
Kachuga	Indian Roof Turtle	)–	3	Least Risk
Callagur	Painted Batagur	)		
Orlitia	Borneo Pond Turtle	)		
Geoemyda	Terrestrial Turtles	)		
Family Testudinidae				
Kinixys	Hinged Tortoises	)		
Homopus	Parrot-beaked Tortoises	)–	3	Least Risk
Pyxis	Spider Tortoise	)		
Malachochersus	Pancake Tortoise	)		
Testudo				
T. elephantopus	Galapagos Giant Tortoise		2	Less Risk
T. gigantia	Aldabra Giant Tortoise		2	Less Risk
*T.*spp.	Common Tortoises			
	(over 0.3m. carapace length)		2	Less Risk
Pseudotestudo	Kleinmann's Tortoise	)		
Geochelone	Star, Leopard & Spur Tortoises	)		
Psammobates	Geometric & Tent Tortoises	)		
Chersina	Bowsprit Tortoise	)		
Asterochelys	Radiated Tortoise	)		
Acinixys	Madagascan Tortoise	)–	3	Least Risk
Aldabrachelys	Aldabra Tortoise	)		
Agrionemys	Horsfield's Tortoise	)		
Manouria	Southern Asian Tortoise	)		
Indotestudo	Southern Asian Tortoise	)		
Chelonoidis	Red-footed Tortoise	)		
Gopherus	Gopher Tortoise	)		
Family Dermochelyidae				
Dermochelys	Leather-back Turtle		3	Least Risk
Family Chelonidae				
Chelonia	Green Turtle		2	Less Risk
Eretmochelys	Hawksbill Turtle		2	Less Risk
Caretta	Loggerhead Turtle		2	Less Risk
Lepidochelys	Ridley Turtles		2	Less Risk
Family Carettochelyidae				
Carettochelys	Pitted-shell Turtle		2	Less Risk
Family Trionychidae				
Lissemys	Soft Terrapin	)		
Cyclanorbis	Nubian & Senegal Softshell Turtles	) specimens with carapace length over 0.3m:	2	Less Risk
Cycloderma	Aubrey's & Bridled Softshell Turtles)	)		

Chitra	River Softshell Turtles)	smaller	3	Least Risk
Pelochelys	Softshell Turtles)	specimens:		
Dogania	Softshell Turtles)			
Trionyx	Softshell Turtles)			
Family Crocodylidae				
Crocodylus	Crocodiles		1	Greater Risk
0steolaemus	Dwarf Crocodiles		1	Greater Risk
Tomistoma	False Gharial		1	Greater Risk
Alligator	Alligators			
	Specimens over 1.om		1	Greater Risk
	Smaller specmens		2	Less Risk
Caiman	Caimans		1	Greater Risk
Gavialis	Gharials		1	Greater Risk
Order RHYNCHOCEPHALIA				
Family Sphenodontidae				
Sphenodon	Tuatara		3	Least Risk
Order SQUAMATA*Sub-order* Sauria				
Family Gekkonidae				
Hemidactylus	Banded Leaf-toed Geckos)			
Gehyra	Pacific Geckos)			
Phyllodactylus	European Leaf-fingered Geckos)			
Gymnodactylus	Naked-toed Geckos)			
Alsophylax	Asian Gecko)			
Lygodactylus	Common Dwarf Gecko)			
Chondrodactylus	Sand Gecko)			
Ptenopus	Garulous Gecko)			
Afroedura	South African Geckos)			
Pachydactylus	Spotted Gecko)			
Palmatogecko	Web-footed Geckos)			
Ptyodactylus	House Geckos)			
Stenodactylus	Desert Geckos)			
Saurodactylus	Lizard-fingered Geckos)			
Phelsuma	Madagascan Geckos)			
Uroplatus	Madagascan Leaf-tailed Geckos)–		3	Least Risk
Gekko	Common and Tokay Geckos)			
Ptychozoon	Kuhl's Gecko)			
Eublepharis	Panther Gecko)			
Teratoscincus	Asiatic Nocturnal Gecko)			
Rhacodactylus	New Caledonia Geckos)			
Coleonyx	Banded Gecko)			
Gonates	Padless Geckos)			
Sphaerodactylus	Least Geckos)			
Nephurus	Australian Gecko)			

Oedura	Fat-tailed Gecko)			
Phyllurus	Australian Gecko)			
Naultinus	New Zealand Diurnal Gecko)			
Hoplodactylus	New Zealand Nocturnal Gecko)			
Thecadactylus	Smooth Geckos)			
Hemiphyllodactylus	Small-leafed Geckos)			
Tarentola	Common Geckos)			
Family Pygopodidae				
Pygopus)				
Lialis)				
Delma)–	Australian Snake Lizards		3	Least Risk
Aprasia)				
Pletholax)				
Paradelma)				
Family Dibamidae				
Dibamus	Burrowing Geckos		3	Least Risk
Family Iguanidae				
Sceloporus	Spiny Lizards)			
Sator	Spiny Lizards)			
Urosaurus	Tree Lizard)			
Uta	Side-blotched Lizard)			
Petrosaurus	Banded Rock Lizard)			
Uma	Fringe-toed Lizard)			
Holbrookia	Earless Lizard)			
Callisaurus	Zebra-tailed Lizard)			
Phrynosoma	Horned Lizard)			
Crotaphytus	Collared Lizard)			
Gambelia	Leopard Lizard)			
Tropidurus	Tropidurine Lizard)			
Platynotus	Iguana-Lizard)			
Ctenoblepharis	Peruvian Iguana-Lizard)			
Phrynosaura	Argentine Iguana-Lizard)			
Strobilurus	Iguana-Lizard)			
Uracentron	Spiny-tailed Iguanas)			
Uranoscodon	Spiny-tailed Iguanas)			
Plica	Iguana-Lizard)			
Leiocephalus	Crested Keeled Lizards)–		3	Least Risk
0phryoessoides	Crested Keeled Lizards)			
Liolaemus	Smooth-throated Lizards)			
Phymaturus	Chilean spiny-tailed Iguanas)			
Proctotretus	Spiny-tailed Iguanas)			
Stenocercus	Narrow-tailed Lizards)			
0plurus	Madagascan Iguana)			
Chalarodon	Madagascan Iguana)			

Hoplocercus	Weapon-tail	)		
Enyaloides	Iguana-Lizard	)		
Morunasaurus	Iguana-Lizard	)		
Iguana	Common Iguanas	)		
Cyclura	Rhinoceros Iguana	)		
Amblyrhynchus	Galapagos Marine Iguana	)		
Conolophus	Galapagos Land Iguana	)		
Brachylophus	Fijian Iguana	)		
Ctenosaura	Black Iguanas	)		
Enyaliosaurus	Iguana Lizard	)		
Dipsosaurus	Desert Iguana	)		
Sauromalus	Chuckwalla	)		
Basiliscus	Basilisks	)		
Corytophanes	Helmeted Lizard	)		
L*aemanctus*	Casque-headed Lizard	)		
Polychrus	Long-legged Lizard	)		
Polychroides	Long-legged Lizard	)		
Enyalius	Brazilian Tree Lizard	)		
Aporopristis	Anole Lizards	)		
Pristidactylus	Anole Lizards	)		
Diplolaemus	Patagonian Lizard	)		
Leiosaurus	Anole Lizards	)		
Urostrophus	Anole Lizards	)		
Cupriguanus	Anole Lizards	)		
Aptycholaemus	Anole Lizards	)–	3	Least Risk
Anisolepis	Anole Lizards	)		
Tropidodactylus	Anole Lizards	)		
Xiphocercus	Sword-tailed Iguana	)		
M*ariguana*	Anole Lizards	)		
Deiroptyx	Cuban Water Anole	)		
Audantia	Anole Lizards	)		
N*orops*	Anole Lizards	)		
Chamaeliolis	False Chameleon	)		
Chamaelinorops	Hispaniolan False Chameleons	)		
Phenacosaurus	False Anoles	)		
Anolis	Anoles	)		
Fanily Agamidae				
Agama	Common Agama Lizards	)		
Uromastyx	Spiny-tailed Agama Lizards	)		
Phrynocephalus	Toad-headed Agama Lizards	)		
Moloch	Moloch	)		
Anphibolurus	Australian Agama Lizards	)		
Tympanocryptis	Australian Agama Lizards	)		
Diporiphora	Australian Agama Lizards	)		

Chlamydosaurus	Frilled Lizards	)		
Physignathus	Water Dragons	)		
Hydrosaurus	Water Lizards	)		
Gonocephalus	Angle-headed Lizards	)		
Acanthosaura	Angle-headed Lizards	)		
Lyriocephalus	Lyre-headed Lizards	)–	3	Least Risk
Calotes	Bloodsuckers	)		
0riocalotes	Tree Agama Lizards	)		
Lophocalotes	Tree Agama Lizards	)		
Hylagama	Tree Agama Lizards	)		
Harpesaurus	Tree Agama Lizards	)		
Chelosania	Tree Agama Lizards	)		
Psammophilus	Agama Lizards	)		
Japalura	Agama Lizards	)		
Phoxophrys	Agama Lizards	)		
Aphaniotis	Agama Lizards	)		
Cophotis	Deaf Lizards	)		
Ceratophora	Horned Agama Lizards	)		
Otocryptis	Indian Horned Agama Lizards	)		
Ptyctolaemus	Assam Horned Agama Lizards	)		
Mictopholis	Assam Horned Agawa Lizards	)		
Leiolepis	Butterfly Lizards	)		
Sitana	Sita's Agama Lizards	)		
Draco	Flying Dragons	)		
0rodeira	Agama Lizards	)		
Paracolates	Agama Lizards	)		
Salea	Agama Lizards	)		
Family Chamaeleontidae				
Chamaeleo	Prehensile-tailed Chameleons	)		
Brookesia	Non-prehensile-tailed Chameleons	)–)	3	Least Risk
Family Scincidae				
Corucia	Prehensile-tailed Skinks	)		
Macroscincus	Cape Verde Skink	)		
Tiliqua	Blue-tongued Skinks	)		
Egernia	Spiny-tailed Skinks	)		
Scincus	Common Skinks	)		
Scincopus	Black-banded Yellow Skinks	)		
0phiomorus	Sand Skinks	)		
Eumeces	Lizard-like Skinks	)		
Sphenops	Levantine Skinks	)		
Chalchides	Cylindrical Skinks	)		
Mabuya	Mabuyas	)		
Eumecia	African Mabuya-like Skinks	)		

Sphenomorphus	Eastern Forest Skinks	)		
Ctenotus	Australian Forest Skinks	)		
Lygosoma	Slender Skinks	)		
Leiolopsina	Slender Eastern Skinks	)–	3	Least Risk
Dasia	Slender Tree Skinks	)		
Emoia	Coastal Skink	)		
Cryptoblepharus	Island Skink	)		
Riopa	Riopas	)		
Tropidophorus	Keeled Skinks	)		
Ristella	Retractable-clawed Skinks	)		
Tribolonotus	Casque-headed Skinks	)		
Ablepharus	Lidless Skinks	)		
Panapsis	African Snake-eyed Skinks	)		
0phioscincus	Snake Skinks	)		
Scelotes	Southern African Skinks	)		
Acontias	Dart Skinks	)		
Typhlosaurus	Blind Skinks	)		
Neoseps	Florida Sand Skink	)		
Sepsina	Angolan Snake Skink	)		
Family Feylinidae				
Feylinia	African Burrowing Lizard		3	Least Risk
Family Anelytropsidae				
Family Xantusidae				
Cricosaura	Cuban Night Lizard	)		
Lepidophyma	Night Lizard	)		
Klauberina	Island Night Lizard	)–	3	Least Risk
Xantusia	Granite and Desert Night Lizards)	)		
Family Lacertidae				
Lacerta	Common Lizards	)		
T1mon	Jewelled Lizards	)		
Podarcis	Wall Lizards	)		
Scelarcis	Clear-lidded Lizard	)		
Zootoca	Common Viviparous Lizards	)		
Centromastix	Spiny-tailed Lacerta Lizards	)		
Algyroides	Keel-scaled Lizards	)		
Psammodromus	Plated Lizards	)		
0phisops	Snake-eyed Lizard	)–	3	Least Risk
Eremias	Desert Racerunners	)		
Acanthodactylus	Fringe-toed Lizards	)		
Aprosaura	South African Spade-head Lizard	))		
Nucras	Blunt-headed Lizard	)		
Poromera	West African Tree Lizard	)		

Holapsis	Fringe-tailed Lizard	)		
Takydroaus	Oriental Grass Lizards	)		
Tropidosaura	South African Mountain Lizard)			
Ichnotropis	Rough-scaled Lizards	)		
Family Teiidae				
Callopistes	Chilean Spotted Lizards	)		
Cnemidophoirus	Racerunners	)		
Ameiva	Jungle Runners	)		
Calliscincopus	Even-scaled Racerunners	)		
Kentropyx	Keel-scaled Teyu	)		
Teius	Teyu (not Tegu)	)		
Dicrodon	Peruvian Teyu	)		
Tupinambis	Tegus	)		
Tejovaranus	False Monitor	)		
Dracaena	Caiman Lizard	)		
Crocidolurus	Dragon Lizardet	)–	3	Least Risk
Neusticurus	Water Teids	)		
Gymnophthalmus	Spectacled Teids	)		
Bachia Earless	Teids	)		
Alopoglossus	South American Teid Lizards	)		
Leposoma	South American Teid Lizards	)		
Pantodactylus	South American Teid Lizards	)		
0phiognomon	Snake Teids	)		
Scoleosaurus	Worm Teids	)		
Proctoporus	Trinidad Teid Lizard	)		
Echinosaura	Rough Teids	)		
Anadia	Small Tree Teid Lizards	)		
Family Cordylidae				
Cordylus	Club-tailed Lizards	)		
Pseudocordylus	False Club-tailed Lizards	)		
Platyaurus	Flat Lizards	)		
Chamaesaura	Snake Lizards	)		
Gerrhosaurus	Plated Lizards	)–	3	Least Risk
Angolosaurus	Angolan Plated Lizards	)		
Cordylosaurus	Angolan Desert Lizards	)		
Tetradactylus	Whip Lizards	)		
Zonosaurus	Girdled Lizard	)		
Tracheloptychus	Keeled Lizard	)		
Family Anguidae				
Diploglossus	Galliwasps	)		
Wetmorena	Hispaniolan Lizard	)		
Sauresia	Hispaniolan Lizard	)		
Ophidiodes	Worm Lizard	)–	3	Least Risk
Ophisaurus	Sheltopusik and Glass Lizards)			

Gerrhonotus	Alligator Lizard	)		
Abronia	South American Tree Lizard	)		
Anguis	Slow Worm	)		
Family Anniellidae				
Anniella	Shovel-snouted Legless Lizard		3	Least Risk
Family Xenosauridae				
Shinisaurus	Crocodile Lizard	)–	3	Least Risk
Xenosaurus	Xenosaurs	)		
Family Varanidae				
Varanus				
V. salvator	Water Dragon		2	Less Risk
V. niloticus	Nile Monitor		2	Less Risk
V. exanthematicus	Desert Monitor		2	Less Risk
V. komodoensis	Komodo Dragon		1	Greater Risk
V. bengalensis	Bengal Monitor		2	Less Risk
V. varius	Variegated Monitor		2	Less Risk
V. gigantus	Giant Monitor		2	Less Risk
V. indicus	Mangrove Monitor		2	Less Risk
V. spp.	other Varanids		3	Least Risk
Family Lanthanotidae				
Lanthanotus	Borneo Earless Monitor		3	Least Risk
Family Helodermatidae				
Heloderma	Gila Monster and Beaded Lizard		1	Special Venom Risk
Sub-order Amphisbaenia				
Family Bipedidae				
Bipes	Common Two-legged Worm Lizard		3	Least Risk
Family Amphisbaenidae				
Amphisbaena	Worm Lizard	)		
Leposternon	Worm Lizard	)		
Anops	King's Worm Lizard	)		
Blanus	Worm Lizard	)		
Cynisca	African Worm Lizard	)		
Zygaspis	African Worm Lizard	)		
Monopeltis	African Worm Lizard	)		
Rhineura	African Worm Lizard	)		
Ancylocranium	Worm Lizard	)–	3	Least Risk
Aulura	Worm Lizard	)		
Baikia	Worm Lizard	)		
Bronia	Worm Lizard	)		
Cadea	Worm Lizard	)		
Chirindia	Worm Lizard	)		
Geocalamus	Worm Lizard	)		
Loveridgea	Worm Lizard	)		
Mesobaena	Worm Lizard	)		
Tomuropeltis	Worm Lizard	)		

Family Trogonophidae				
Trogonophis	Sharp-tailed Worm Lizard	)		
Agamodon	Pink-bellied Worm Lizard	)–	3	Least Risk
Pachycalamus	Worm Lizards	)		
Diplometopodon	Worm Lizards	)		
Sub-order Serpentes				
Family Typhlopidae				
Typhlops	Blind Snakes	)		
Tychlina	Australian Blind Snakes	)		
Anomalepsis	South American Blind Snakes	)–	3	Least Risk
Helmintophis	South American Blind Snakes	)		
Liotyphlops	South American Blind Snakes	)		
Typhlopis	South American Blind Snakes	)		
Family Leptotyphlopidae				
Leptotyphlops	Slender Blind Snakes	)–	3	Least Risk
Rhinoleptus	Slender Blind Snakes	)		
Family Anilidae				
Anilius	South American Pipe Snakes	)–	3	Least Risk
Cylindrophis	Asian Pipe Snakes	)		
Family Uropeltidae				
Rhinophis	Ceylon Shield-tailed Snakes	)		
Uropeltis	Indian Shield-tailed Snakes	)–	3	Least Risk
Melanophidium	Shield-tailed Snakes	)		
Family Xenopeltidae				
Xenopeltis	Sunbeam Snakes		3	Least Risk
Family Acrochordidae				
Acrochordus	Hart Snakes	)–	3	Least Risk
Chersydrus	Indian Wart Snakes	)		
Family Boidae				
Loxocemus	Mexican Python		3	Least Risk
Python	Pythons specimens over 3 m.		1	Greater Risk
	Pythons: smaller specimens		2	Less Risk
Morelia	Carpet Python		2	Less Risk
Liasis	Liasine or Chondropython		2	Less Risk
Bothrochilus	New Guinea Python		2	Less Risk
Aspidites	Black-headed Pythons		2	Less Risk
Calabaria	Burrowing Python		3	Least Risk
Tropidophis	Wood Snakes		2	Less Risk
Trachyboa	South American Boas	)		
Ungaliophis	South American Boas	)		
Epicrates	Rainbow and Caribbean Boas	)		
Charina	Rubber Boas	)		
Lichanura	Rosy Boas	)–	3	Least Risk
Acrantophis	Madagascar Boa Constrictor	)		

Sanzinia	Madagascar Tree Boa	)		
Eryx	Sand Boas	)		
Candoia	Pacific Boas	)		
Corallus	Tree Boa	)		
Boa	Boa Constrictor			
	specimens over 2 m.		1	Greater Risk
	Boas: smaller specimens		2	Less Risk
Eunectes	Anaconda specimens over 2 m.		1	Greater Risk
	Anacondas: other specimens		2	Less Risk
Bolyeria	Round Island Boas	)–	3	Least Risk
Casarea	Round Island Boas	)		
Family Colubridae				
Xenodermus	Xenodermine Snake	)		
Achalinus	Achaline Snake	)		
Fimbrios	Fimbrio Snakes	)		
Sibynophis	Sibyonine Snakes	)		
Scaphiodontophis	Dagger-toothed Snakes	)		
Liophodium	Liophoid Snakes	)–	3	Least Risk
Xenodon	Xenodont Snakes	)		
Heterodon	Hog-nosed Snakes	)		
Xenopholis	Colubrid Snakes	)		
Nothopsis	Colubrid Snakes	)		
Natrix	Water and Grass Snakes	)		
Rhabdophis	Yamakagashi	1	Special Venom Risk	
Regina	Water snakes	)		
Clonophis	Water snakes	)		
Thamnophis	Garter Snakes	)		
Helicops	South American	)		
	Smooth-toothed Snakes	)		
Coronella	Smooth Snakes	)		
Lampropeltis	King Snakes	)		
Eirenis	Dwarf Snakes	)		
Opheodrys	Green Snakes	)		
Coluber	Racers	)		
Masticophis	Whip Snakes	)–	3	Least Risk
Drymnobius	Speckled Racers	)		
Drymarchon	Indigo Snakes	)		
Salvadora	Patch-nosed Snakes	)		
Phyllorhynchus	Leaf-nosed Snakes	)		
Elaphe	Rat Snakes	)		
Dendrelaphis	Indian Tree Snakes	)		
Chlorophis	African Tree Snakes	)		
Leptophis	South American Tree Snakes	)		
Rhadinea	South American Tree Snakes	)		

Thrasops	Black Tree Snakes		
Hydrodynastes	False Water Cobra	2	Less Risk
Ptyas	Asian Rat Snakes	3	Least Risk
Spilotes	Black and Yellow Rat Snake	2	Less Risk
Chironius	Sipo		
Calamaria	Dwarf Snake		
Lycodon	Asian Wolf Snakes		
Lycophidium	African Wolf Snakes		
Mehelya	File Snakes		
Boaedon	Brown House Snakes		
Lioheterodon	Madagascar Black-brown Snake		
Bothrophthalmus	Central African Red-bellied Snake	3	Least Risk
Farancia	Mud Snakes		
Sibon	Snail-eating Snakes		
Dipsas	Snail-eating Snakes		
Sibynomorphus	Snail-eating Snakes		
Dasypeltis	African Egg-eating Snakes		
Elachistodon	Indian Egg-eating Snakes		
Homalopsis	Water Snake	2	Less Risk
Cerberus	Water Snake	2	Less Risk
Enhydris	Water Snake	2	Less Risk
Fordonia	White-bellied Water Snake		
Bitia	Ribbon-bodied Water Snake	3	Least Risk
Erpeton	Tentacled Snake		
Boiga			
B. dendrophila	Mangrove Snake	1	Special Venom Risk
B. spp.	other Boigan species	2	Less Risk
Langaha	Vine-like Snake	3	Least Risk
Eteirodipsas	Madagascar Boigine Snake	2	Less Risk
Telescopus	European Boigine Snake	2	Less Risk
Macroprotodon	European Boigine Snake	2	Less Risk
Leptodeira	Cat-eyed Snake	2	Less Risk
Oxyrhopus	South American Boigine Snake	2	Less Risk
lmantodes	South American Boigine Snake	3	Least Risk
Clelia	Mussurana	1	Special Venom Risk
Ahaetulla	Horizontal-pupilled Snake		
Thelotornis	Twig Snake	2	Less Risk
Oxybelis	Vine Snakes	3	Least Risk
Chrysopelea	Flying Snake		
Malopon	Montpelier Snakes	1	Special Venom Risk
Psammophis	Swift Snakes	2	Less Risk
Dispholidus	Boomslang	1	Special Venom Risk

Family Elapidae			
0phiolagus	King Cobra	1	Special Venom Risk
Naja	Cobras	1	Special Venom Risk
Hemachatus	Ringhals	1	Special Venom Risk
Pseudohaje	Cobras	1	Special Venom Risk
Walterinnesia	Desert Black Snakes	1	Special Venom Risk
Aspidelaps	Shield-nose Snakes	1	Special Venom Risk
Elaps	African Cobras	1	Special Venom Risk
Elapsoidea	African Cobras	1	Special Venom Risk
Boulengerina	Water Cobras	1	Special Venom Risk
Dendroapsis	Mambas	1	Special Venom Risk
Bungarus	Kraits	1	Special Venom Risk
Calliophis	Oriental Coral Snakes	1	Special Venom Risk
Maticora	Long-glanded Coral Snakes	1	Special Venom Risk
Micrurus	American Coral Snakes	1	Special Venom Risk
Micruroides	Western Coral Snakes	1	Special Venom Risk
Leptomicrurus	Slender Coral Snakes	1	Special Venom Risk
0xyuranus	Taipan	1	Special Venom Risk
Acanthophis	Death Adder	1	Special Venom Risk
Notechis	Australian Tiger Snakes	1	Special Venom Risk
Pseudechis	Australian Black Snakes	1	Special Venom Risk
Demansia	Australian Brown Snakes	1	Special Venom Risk
Denisonia	Australian Copperheads	1	Special Venom Risk
Family Laticaudidae			
Laticauda	Sea Kraits	1	Special Venom Risk
Aipysurus	Olive-brown Sea Snake	1	Special Venom Risk
Emydocephalus	Western Pacific Sea Kraits	1	Special Venom Risk
Family Hydrophiidae			
Hydrophis	Sea Snakes	1	Special Venom Risk
Enhydrina	Beaked Sea Snake	1	Special Venom Risk
Lapemis	Sea snake	1	Special Venom Risk
Pelamis	Yellow-bellied Sea Snake	1	Special Venom Risk
Microcephalophis	Small-headed Sea Snakes	1	Special Venom Risk
Family Viperidae			
Vipera	True Adders and Vipers	1	Special Venom Risk
Azemiopus	Fea's Viper	1	Special Venom Risk
Echis	Saw-scaled Viper	1	Special Venom Risk
Eristicophis	McMahon's Viper	1	Special Venom Risk
Pseudocerastes	False Cerastes	1	Special Venom Risk
Cerastes	Horned and Common Sand Vipers	1	Special Venom Risk
Bitis	Puff Adders	1	Special Venom Risk
Atheris	African Tree Vipers	1	Special Venom Risk
Atractaspis	Burrowing Vipers	1	Special Venom Risk
Causus	Night Adders	1	Special Venom Risk

Family Crotalidae				
Crotalus	Rattlesnakes		1	Special Venom Risk
Sistrurus	Pygmy Rattlesnakes		1	Special Venom Risk
Bothrops	Lance-head Snakes		1	Special Venom Risk
Trimeresurus	Asian Lance-head Snakes		1	Special Venom Risk
Lachesis	Bushmaster		1	Special Venom Risk
Agistrodon	Copperheads and Moccasins		1	Special Venom Risk
Class Amphibia				
Order CAECILIA				
Family Ichthyophiidae	Caecilians	)		
Family Typhlonectidae	Caecilians	)–	3	Least Risk
Family Caeciliidae	Caecilians	)		
Order CAUDATA				
Family Cryptobranchidae	Giant Salamanders	)		
Family Hynobiidae	Salamanders	)		
Family Sirenidae	Mud Sirens	)		
Family Proteidae	Olms	)		
Family Salamandridae	Salamanders	)–	3	Least Risk
Family Amphiumidae	Congo Eels (not Teleost Fish)	))		
Family Ambystomatidae	Salamanders and Axolotl)			
Familv Plethodontidae	Lungless Salalmanders	)		
Order ANURA				
Family Leiopelmatidae	New Zealand Frogs	)		
Family Ascaphidae	Tailed Frog	)		
Family Pipidae	Clawed Toads	)		
Family Discoglossidae	Midwife Toads	)–	3	Least Risk
Family Rhinophrynidae	Burrowing Toad	)		
Family Pelobatidae	Spadefoot Toads	)		
Family Pelodytidae	Toads	)		
Family Ranidae				
Sub-family Dendrobatinae	Poison Arrow Frogs		1	Special Venom Risk
other Ranid sub-families	Frogs		3	Least Risk
Family Sooglossidae	Seychelles Frogs	)		
Family Rachophoridae	Frogs	)		
Family Hyperoliidae	Frogs	)		
Family Microhylidae	Narrow-mouth Toads	)		
Family Phrynomeridae	Toads	)		
Familv Pseudidae	Toads	)–	3	Least Risk
Family Bufonidae	Toads	)	3	
Family Atelopodidae	Frogs	)	3	
Family HylidaeTree	Frogs	)	3	
Family Leptodactylidae	Frogs	)	3	
Family Myobatrachidae	Frogs	)	3	
Family Centrolenidae	Frogs	)		

FISHES			
Class Teleostomi	(Boney Fishes)		
Order ANGUILLIFORMES			
Family Muraenidae	Moray Eel	1	Greater Risk
Family Congridae	Conger Eel	2	Less Risk
Order SALMONIFORMES			
Family Esocidae	Pikes	2	Less Risk
Order CYPRINIFORMES			
Family Characidae			
Serrasalmus	Piranha	2	Less Risk
Family Electrophoridae	Electric Eel	1	Special Electric Risk
Order SILURIFORMES			
Family Clariidae	Catfish	2	Less Risk
Family Malapteruridae	Electric Cat Fish	2	Less Risk
Family Ariidae	Sea Cat Fish	2	Less Risk
Family Plotosidae	Cat Fish	2	Less Risk
Order BATRACHOIDIFORMES			
Family Batrachoididae	Toad Fish	1	Special Venom Risk
Order CHANNIFORMES			
Family Channidae	Snake Head	2	Less Risk
Order SCORPAENIFORMES			
Family Scorpaenidae	Scorpion Fishes	1	Special Venom Risk
Family Syanceidae	Stone Fish	1	Special Venom Risk
Order PERCIFORMES			
Family Sphyraenidae	Barracudas	2	Less Risk
Family Trachinidae	Weever Fish	2	Less Risk
Family Uranoscopidae	Star-Gazers	1	Special Venom Risk
Family Siganidae	Rabbit Fish (Teleost)	2	Less Risk
Order TETRAODONTIFORMES			
Family Balistidae	Trigger Fish (larger specimens only)	2	Less Risk
Class Elasmobranchiomorphii (Cartilage Fishes)			
Order ELASMOBRANCHII			
Family Hexanchidae	Comb-toothed Sharks	1	Greater Risk
Family Odontaspididae	Sand Shark	1	Greater Risk
Family Lamnidae	Porbeagle Shark	1	Greater Risk
Family Orectolobidae	Carpet And Nurse Sharks	1	Greater Risk
Family Carcharhinidae	Grey And Tiger Sharks	1	Greater Risk
Family Alopiidae	Thresher Shark	1	Greater Risk
Family Sphyrnidae	Hammerhead Sharks	1	Greater Risk
Family Squatinidae	Monk Fish	2	Less Risk
Family Dasyatidaen	Sting Rays	2	Less Risk
Family Myliobatididae	Eagle Ray	2	Less Risk
Family Potamotrygonidae	Freshwater Sting Rays	1	Special Venom Risk

Family Torpedinidae	Electric Rays	1	Special Electric Risk
Order Holocephali			
Family Chimaeridae	Rabbit Fish (Elasmobranch)	2	Less Risk
INVERTEBRATES			
Phylum MOLLUSCA			
Class Cephalopoda			
Hapalochlaena			
H. maculosa	Blue-ringed Octopus	1	Special Venom Risk
Class Gasteropoda			
Family Conidae	Cone shells (some species)	1	Special Venom Risk
Phylum ARTHROPODA			
Sub-Phylum ARACHNIDA			
Class Araneida			
Family Theriidae			
Latrocectus	Black Widow Spiders		
	= Redback Spiders	1	Special Venom Risk
Family Sicariidae			
Loxosceles	Brown Recluse Spiders		
	= Violin Spiders	1	Special Venom Risk
Family Lycosidae			
Lycosa			
L. raptoria	Brazilian Wolf Spider	1	Special Venom Risk
Family Dipluridae			
Atrax	Australian Funnel-web Spiders	1	Special Venom Risk
Family Ctenidae			
Phoneutria	Wandering Spiders	1	Special Venom Risk
Class Scorpionidea			
Family Buthidae	Buthid Scorpions	1	Special Venom Risk

APPENDIX 13

Bibliography

The documents listed here were found useful for reference by the authors of the revised Zoo Standards. Zoo Inspectors may also find these references useful when dealing with specialist collections. Information regarding documents referred to can be sourced from the British Library.

This bibliography is sub-divided into the categories listed below.

1. Guidelines for the keeping and management of mammals, birds, reptiles and amphibians, invertebrates and general collections.

2. Veterinary Care

3. Zoo Development and Education

4. Legislation, Statutory Guidance and Codes of Practice

5. Welfare

6. Conservation

7. Other animal keeping regimes:–
   – On the farm;
   – In the laboratory;
   – At the circus;
   – During film work.

   On the farm; the laboratory; the circus; film work.

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