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Secretary of State's Standards of Modern Zoo Practice

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Introduction

1. The EC Zoos Directive (Directive 1999/22/EC) requires EU Member States to regulate zoos in accordance with its provisions. The Directive is transposed into national legislation in England by means of the Zoo Licensing Act 1981 (Amendment) (England and Wales) Regulations 2002. Defra issued guidance on the provisions of the Zoo Licensing Act 1981 ('the Act') in 2012[1].

2. References in these Standards, including to legislation, apply to England. Differences may apply in Wales and Scotland

3. In pursuance of section 9 of the Act, the Secretary of State, having consulted such persons on a list compiled under Section 8 of the Act, and other persons as she has seen fit, hereby specifies the following Standards of Modern Zoo Practice (the Standards); 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.

4. To aid the application of these Standards, pre-inspection audit forms and inspection report forms are available at the following link http://animalhealth.defra.gov.uk/cites/zoos-inspectorate.html. Pre-inspection audit forms should be completed by zoo operators prior to inspections and inspection report forms should be used by zoo inspectors to report their findings.

5. 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 guidance issued by the Health and Safety Executive, 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.

6. These Standards are supplemented by the Zoos Expert Committee Handbook[2] which provides further detail and guidance. The Handbook can be viewed on the following page of the Defra website: http://www.defra.gov.uk/wildlife-pets/zoos/

Interpretation of terms used

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

- 'animal' means animals of the classes Mammalia, Aves, Reptilia, Amphibia, Pisces and Insecta (i.e. any mammal, bird, reptile, amphibian, fish or insect) or other multicellular 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;
- '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;

[1] 'Zoo Licensing Act 1981: Guide to the Act's Provisions' replaced Government Circular 02/2003 in 2012.
[2] The Zoos Forum Handbook was replaced by the Zoos Expert Committee Handbook in 2012

- 'enclosure barrier' means a physical barrier to contain an animal within an enclosure;
- 'keeper' includes any person employed under the direction of a keeper;
- 'the list' means the list compiled by the Secretary of State under section 8 of the Zoo Licensing Act 1981. This list comprises persons responsible for the inspection of animals in zoos, and for advising on their keeping and welfare, and the management of zoos generally;
- 'pet shop' means premises for whose keeping as a pet shop a licence is in force, or 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 the Act as an establishment where wild animals (as defined above) are kept for exhibition to the public otherwise than for purposes of a circus ('circus' means a place where animals are kept or introduced wholly or mainly for the purpose of performing tricks or manoeuvres at that place) and otherwise than in a pet shop (as defined above). The Act applies to any zoo to which members of the public have access, with or without charge for admission, on seven days or more in any period of 12 consecutive months. Under the EC Zoos Directive, zoos may be exempted from the requirements of the 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 the Directive.

Animal welfare in the zoo environment

8. The five principles below, described in more detail in subsequent sections, provide a framework for the Standards. These five principles are based on the 'Five Freedoms' drawn up for livestock by the Farm Animal Welfare Committee.

Provision of food and water

9. 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

10. An environment consistent with species requirements must be provided. This should include shade and shelter from rain, heat and cold 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

11. 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.

12. 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

13. 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

14. 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 areas and the group composition should reflect this situation.

15. Enclosure design should provide areas of escape from other animals and the public.

16. 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 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 appropriate for the species, and for the condition, size and physiological, reproductive and health status of the individual animals.

1.2 Sufficient fresh, clean drinking water must be available at all times for all animals requiring it.

1.3 Supplies of food and drink must 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;

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 must not 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.

1.5 Feeding methods must be safe for animals and staff.

1.6 Live feeding of vertebrate prey is to be discouraged (see Section 5). Although the Animal Welfare Act 2006 does not prohibit the feeding of animals with live prey, the live feeding of vertebrate prey should be avoided save under exceptional circumstances, and only under veterinary advice. Where it has to be undertaken, a written justification and ethical review process must have been undertaken and agreed by senior staff weighing up the welfare of predator and prey; feeding must be observed and live prey not left in the enclosure. Such feeding should not take place in the presence of the public.

1.7 Food and drink, and feeding and drinking receptacles when used, must 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, must 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 must 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 and dietary changes must be maintained.

Section 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.

(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 in barriers or appliances 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; a record should be kept of any action taken;

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

c) 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;

d) 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.

Section 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(s) in direct charge of their care consistent with avoiding unnecessary stress or disturbance.

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(s) 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 and enclosures must be managed so 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 aiding animal escape.

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

Veterinary care

(See also 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 the 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; and

d) 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 and 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 for as long as is necessary to ensure proper examination, acclimatisation and quarantine before introduction to other animals in the collection.

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 should be instructed to report in confidence any medical condition or disability which might affect their 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)

Section 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 overpopulation.

4.2 Zoos must keep up-to-date with 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 must take account of the natural habitat of the species and seek to meet the physiological and psychological needs of the animal.

4.4 Enclosures must be equipped in accordance with the needs of the animals with bedding material, branchwork, burrows, nesting boxes, pools, substrates 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 of 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.

Section 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 and 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 must be prohibited except in designated areas. In open-air collections smoking by visitors must be prohibited where the health and welfare of animals will be compromised.

Section 6 - Transportation and movement of live animals

(**See also Appendix 4 – Animal transport, acquisition and disposal; and Appendix 7 – Training of 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 in its Appendices. CITES is implemented within the EU by way of two regulations which in many respects are stricter than CITES. 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 Defra 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 of the other animals.

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.

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.

Section 7 - Conservation and education measures

(See also Appendix 1 – The EC Zoos Directive and Appendix 3 – Conservation and education)

7.1 In 1999 conservation and education became subject to legislative control in the UK when the EC Zoos Directive came into force. These requirements have been transposed into domestic legislation in England and Wales (the Zoo Licensing Act 1981 as amended) and are further explained below.

Conservation measures within and beyond the zoo

7.2 The Directive requires that zoos undertake conservation measures and gives a number of options for doing so. The options given are:

I. participating in research from which conservation benefits accrue to the species, and/or;

II. training in relevant conservation skills, and/or;

III. the exchange of information relating to species conservation and/or;

IV. where appropriate, captive breeding, and/or

V. where appropriate, repopulation or reintroduction of species into the wild.

7.3 Zoos must therefore undertake, as a minimum, at least one of these options. The measures required should be proportionate to the size and type of zoo.

7.4 Where the relevant species are held, a zoo must be an active participant in recognised species management programmes.

7.5 Zoos must be able to demonstrate their conservation measures, including research if undertaken. Areas to be considered should include overall conservation policy, and how this relates to the World Zoo and Aquarium Conservation Strategy, and type and level of input into international conservation programmes.

7.6 Zoos should generally be able to demonstrate that they encourage research. Research can be developed through forging links with Higher Education Institutions.

7.7 In any research carried out, care must be taken to comply with all relevant legislation and be subject to ethical review.

Education measures

7.8 The Directive requires that zoos must promote public education and awareness in relation to the conservation of biodiversity, particularly by providing information about the species exhibited and their natural habitats. The measures required should be proportionate to the size and type of the zoo.

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

7.10 Suitable facilities, commensurate to the size of the zoo, should be available for education purposes.

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

7.12 The zoo should be able to demonstrate:

- the educational role of the zoo as set out in any mission statement;
- how the written education plan applies to different types of people who visit the zoo.

7.13 Zoos should keep records of their conservation and education activities and should be encouraged to evaluate the effectiveness of their contribution to these activities by collecting appropriate evidence and/or engaging in research projects to do this.

7.14 In addition to statutory requirements, as a general principle zoos should establish ethical review processes and, where appropriate, seek appropriate help in planning and implementing their conservation and education strategies.

(See Appendix 2 – Ethical review process)

Section 8 - Public safety in the zoo

(See also Appendix 6 – Animal contact areas and Appendix 8 – Specialist exhibits)

Principles

8.1 Section 5(7) of the 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 relating to public safety must 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 or by other factors, 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. In general, there should be a double gate/door system in place to prevent escape from the secure area should one gate/door be breached.

8.7 Barriers must be designed, constructed and maintained to contain animals within enclosures. Vegetation, climbing structures or other items should be maintained in such a way as to not aid escape.

8.8 Like all enclosure barriers, gates and doors to enclosures must be strong and effective in containing the animals. 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. Where electric fencing is installed it must conform to the appropriate British and European Standards. Electric fencing used for animal containment must be checked daily and have back-up power in case of a power cut.

8.10 Animals that can climb or jump must be kept in enclosures secure enough to prevent them from escaping. The minimum recommended height of enclosures/barriers as stated in national or international industry standards (BIAZA, EAZA or AZA) such as those associations' Husbandry Guidelines should be taken into consideration. Digging or burrowing 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 the species contained within.

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 must 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.

8.15 Areas where visitors are encouraged to go should have surfaces to avoid the risk, as far as is reasonably practicable, of visitors falling or tripping.

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 managed by a suitably qualified person as appropriate to avoid visitors being harmed by falling trees/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 firearm must undergo formal training by a suitably qualified person. Every trained operator should undergo periodic refresher training and practice. Such training should be recorded and available for inspection.

8.20 Where a zoo holds any primate, carnivore, elephant, or hoofed mammal, listed in category 1 of Appendix 12, appropriate firearms must be available, unless a risk assessment has shown that a firearm would not provide the most appropriate means of protection to the public from that animal, and other arrangements have been made. Firearms, ammunition and darting equipment, where provided, must be:

a) available for immediate use by licensed and trained operators;

b) cleaned and maintained as recommended by the manufacturer;

c) kept securely when not in use or under maintenance.

8.21 Appropriate staff must be trained in medicines handling (including those used for chemical restraint): its risks; side effects; human risks if misused; and emergency protocols.

8.22 Where used to contain animals, moats (whether wet or dry) must be surrounded by a stand-off e.g. fences, walls, hedges or shrubbery, sufficient to prevent the public from approaching too close to the edge. Consideration should be given to whether rescue equipment such as lifebuoys should be provided.

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

8.24 Stand-off barriers must be provided and be designed, where necessary, to ensure public safety particularly to prevent direct contact with Category 1 hazardous animals – see Appendix 12.

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

Free-ranging species

8.26 Under Section 14 of the Wildlife and Countryside Act 1981 zoos and others must prevent the deliberate release or permitting to escape into the wild of non-indigenous species. This is particularly relevant if free-ranging species are kept within the zoo grounds but not confined in enclosures.

8.27 Under the EC Zoos Directive zoos are required to be active in '…preventing the escape of animals in order to avoid possible ecological threats to indigenous species'.

8.28 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 which 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 birds to free-fly should encourage them to remain on site by providing roosting areas, nestboxes, and feeding points; and
- enough staff should be available to retrieve birds when lost.

(See Appendix 8.7 – Birds of prey)

Escapes

8.29 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.

8.30 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.

8.31 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.

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

8.33 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, and other relevant personnel as considered necessary, in a written document.

8.34 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 and, where necessary, the licensing authority;
- 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 firearms and darting equipment to tranquillise or kill escaped animals, precise details of which are to be discussed and agreed by the zoo operator and the local police (regular training with firearms and darting equipment should be conducted and documented);
- the provision of adequate equipment for members of any recapture party, including, where necessary, vehicle protection.

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

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

8.37 The zoo must be responsible for the selection of the appropriate firearm or darting equipment to deal with escaped animals.

8.38 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, this should include at least two drills involving the escape of a Category 1 species (where present).

8.39 All escapes must be recorded and detailed reports made. Risk assessments must be continually reviewed in the light of experience. The standard discretionary licence condition 4 in Defra's document Zoo Licensing Act 1981 Guide to the Act's Provisions (Annex F) 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.

8.40 As far as is reasonably practicable, zoos must prevent the release of 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.

Exits

8.41 Exits should be suitably located and adequately signed.

8.42 Each main 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

8.43 Suitable warning signs and information should be provided where animals and visitors may come into contact.

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

8.45 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.

8.46 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.

8.47 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.

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

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

Section 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 from 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 stock record 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 annual stock record 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 outside sources during the year;

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

e) number that died including culls;

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

g) total remaining in the collection at 31 December;

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

9.6 The records should be set out in a multi-column format as follows, or should be similar to those that are produced by ZIMS or ARKS.

Common Name	Scientific Name	Group at 1.1.2011	Arrived	Born	Died	Depar ted	Group at 31.12.2011
White-naped Crane	Grusvipio	2.1.1	0.2.1	0.0.2	1.0.0	0.1.0	1.2.3

Section 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 their staff do not have any convictions under the Zoo Licensing Act 1981 or under any other animal welfare or conservation legislation including that listed in Appendix 9.

Section 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 on 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;
- the telephone number of the zoo and of an appropriate senior staff member;
- the telephone number of the appropriate specialist who 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 needs of visitors, including those with disabilities, where reasonable, practical and appropriate.

Section 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

1.1 Council Directive 1999/22/EC relating to the keeping of wild animals in zoos was given force of law* in 2003 by the countries of the United Kingdom (England, Scotland, Wales and Northern Ireland). By way of background the Directive required Member States to license and inspect zoos to ensure good standards of animal care, and set the framework for the participation of zoos in conservation and education.

1.2 The Directive required 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.'

1.3 Prior to the implementation of the Directive, Britain had 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). This regime already addressed many of the requirements of the Directive, primarily those relating to animal welfare, preventing escapes and record-keeping (the third, fourth and fifth bullet points above). Guidance is provided on all these elements in these Standards. Implementation of the Directive has involved some changes to the British legislation, particularly to introduce the new conservation and education requirements (the first and second bullet points above) and the advent of the 'pre-licensing' inspections.

Closure of zoos

1.4 A significant addition to the regulatory regime that stemmed from the EC Zoos Directive is the provisions for the closure of a zoo. Whilst revocation of a licence is no longer an option under the new legislation, this now provides for partial or full closure in the case of breach of conditions, and for the closure of an unlicensed zoo.

1.5 Another significant innovation that has come from the Directive is that the licensing authority is now required to approve any arrangements made for the welfare or disposal of animals following the closure of a zoo.

*The UK zoo licensing legislation:

England - *The Zoo Licensing Act 1981 (Amendment) (England and Wales) Regulations 2002*

Wales - *The Zoo Licensing Act 1981 (Amendment) (Wales) Regulations 2003.*

Scotland - *The Zoo Licensing Act 1981 Amendment (Scotland) Regulations 2003*

N Ireland - *The Zoo Licensing Regulations (Northern Ireland) 2003*

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 animal. 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 people with disabilities.

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. Guidance on this is given in the Zoos Expert Committee Handbook which can be viewed at the following link on the Defra website http://www.defra.gov.uk/wildlife-pets/zoos/

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

- the committee must not be perceived as being 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 scientists 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 and education

Measures

3.1 Inspectors should assess conservation (including research, if undertaken) and educational standards and advise on performance against them. The Conservation, Education and Research chapter of the Zoos Expert Committee Handbook provides further detailed advice. The Handbook can be viewed at the following link on the Defra website http://www.defra.gov.uk/wildlife-pets/zoos/

Conservation

3.2 Chapter 7 sets out the statutory conservation and education requirements of the Zoos Directive. There are a series of potential options given for conservation measures:

- 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.

3.3 There are a number of options for conservation measures. Inspectors, zoos and local authorities should be familiar with the Zoos Expert Committee Handbook Chapter on Conservation, Education and Research which provides detailed guidance on the types of measures that can be taken to comply with the Directive's requirements.

3.4 Many modern zoos carry out research. Participating in research from which conservation benefits accrue is one of the options to meet the Directive's requirements.

3.5 Participating in research should be within the scope of any collection. At the minimum 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.

3.6 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 (e.g. dietary manipulation, blood sampling) requires careful thought and planning and should be subject to independent assessment.

(See Appendix 2 Ethical review process)

3.7 The Animals (Scientific Procedures) Act 1986 (ASPA) specifies that a regulated procedure (i.e. 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.

3.8 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.

3.9 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 it should also be published.

3.10 Zoos should be encouraged to evaluate the effectiveness of their research. Further guidance on research can be found in the Zoos Expert Committee Handbook Chapter on Conservation, Education and Research.

3.11 There are many ways in which zoos can directly support field conservation projects, including through financial contributions. However, simply seeking donations towards conservation projects, e.g. through collection boxes, will not in itself be sufficient to meet the requirements of the legislation.

Education

3.12 The Zoos Directive requires zoos to promote public education and awareness in relation to the conservation of biodiversity, particularly by providing information about the species exhibited and their natural habitats. Inspectors, zoos and local authorities should be familiar with the Zoos Expert Committee Handbook Chapter on Conservation, Education and Research which provides detailed guidance on the types of measures that can be taken to comply with the Directive's requirements.

3.13 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.

3.14 Inspectors, zoos and local authorities should be familiar with the education standards expected in member zoos of the British and Irish Association of Zoos and Aquariums (BIAZA).

3.15 In addition to written education plans, 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.

Appendix 4 - Animal transport, acquisition and disposal

(see also Appendix 2 – Ethical review process)

4.1 The Animal Transaction Policy of BIAZA should be complied with where appropriate.

Transport of live animals

4.2 Arrangements for transport must comply with the Welfare of Animals (Transport) (England) Order 2006 ; 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
- safeguarding 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 that it is 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 may be 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 a recipient country may fall below the 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. These are preferable to euthanasia of healthy stock.

4.10 Euthanasia is 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; and

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

Appendix 5 - Veterinary facilities

Veterinary services

5.1 The EC Zoos Directive requires 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, or a specialist supported by a local veterinary practice. 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 (but see 5.17 and 8.5.4)

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 (Enforcement) (England) Regulations 2011 .

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 contact 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 e.g. what does a snake feel like?
- the animals may be allowed into larger and more complex areas than 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's document Managing Health and Safety in 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 - Hazardous animal categorisation)

6.9 The zoo must have adequate hand-washing and sanitising facilities, close to the contact point and obviously signposted.

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 face 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:

- appropriate risk assessments, particularly regarding zoonotic diseases and direct or indirect contact with animals, should be undertaken and reviewed regularly by a suitably qualified person (this would usually be a veterinary surgeon). These will be dependent on animal species and exhibit design and should cover risks to both public and animal safety;
- numbers of people allowed in the exhibit at any time, and allowable visitor behaviour and activities, should be consistent with the animals' welfare;
- appropriate staffing must be available, and protocols in place for staff to intervene in defence of either the visitor or animal if any conflict arises;
- staff and/or visitors should have a clearly indicated means of contacting assistance if required, including that of trained first-aiders;
- feeding of animals should only take place under supervision by staff

Diving experience exhibits

6.15 It has become commonplace for the larger public aquaria to allow sports and hobby divers to dive in shark and other tanks and pools as 'workers' to clean them or as a 'visitor experience'. Risk assessments and management of these dives should reflect the status of the diver in this context and the diver must hold a relevant professional qualification.

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.

Touch-pools

6.17 Points 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) protocols should be in place to minimise the stress of the animals used in touch-pools, such as being 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 frequent 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

6.18 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.

6.19 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.

6.20 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.

6.21 For other non-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.

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

6.23 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.

6.24 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.

6.25 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.

6.26 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 least two vehicles wide.

6.27 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.

6.28 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.

6.29 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 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 60 of Commission Regulation (EC) No 865/2006. Article 60 certificates enable all specified Annex A listed 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 60 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; and
- 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 understand 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 Principles 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 BIAZA 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.

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. Personnel responsible for invertebrate collections should, therefore, view veterinary advice from a suitably knowledgeable veterinary surgeon as important in keeping animals healthy.

8.1.8 The 'Notes for Inspectors' produced by BIAZA 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 is 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 20-35ºC however the details vary according to species. Most tortoises and crocodilians need water temperatures in the range 26-32ºC. Temperatures should be monitored and recorded.

Humidity

8.2.4 Relative humidity (RH) is a function of temperature, moisture content of the air and ventilation. However ventilation should not be curtailed to improve humidity. 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 depending on the natural habitat of the species; it is vital that the RH species specifc requirements are met. 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, for 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 maintained by regular replacement of the water and cleaning of the pool surface or a suitable filtration unit. Attention should be given to sudden temperature change and the risk of introducing toxic disinfectant residues during water changes. 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 and other biological agents 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 (see Appendix 9.3). Handling and catching equipment should be readily available close to enclosures, and there should be hand washing facilities for staff.

Feeding

8.2.11 Live feeding of vertebrate prey is to be discouraged (see Section 5). Where it has to be undertaken, a written justification and ethical review process must have been undertaken and agreed by senior staff weighing up the welfare of predator and prey; 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 regularly reviewed against guidelines. 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. De-chlorination 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 staff trained for management are available at all times.

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

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 escape routes or places to hide, 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. The enclosures 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 12 – Hazardous animal categorisation)

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 relevant management guidelines by EAZA, BIAZA, AZA). Cetaceans have not been kept in UK zoos or aquariums for some years. The key references are Klinowska and Brown's *Review of Dolphinaria.*

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 micro-organisms.

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	daily

pH	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 may be required for outdoor penguins in the summer based on veterinary advice.

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 6 - Animal contact areas).

(See Appendix 12 - Hazardous animal categorisation)

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-ionised ammonia), and nitrite; and, on a weekly basis, 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

	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	<15 ºC
Temperature – tropical	23-26 ºC	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 currently 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 cannot 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.

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 to 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 1981 and 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 programme.

- 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.

- **N.B.** 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 seven or more 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.

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.

8.8 Elephants

8.8.1 Elephants are long-lived, highly intelligent animals with large natural ranges and a complex social life. Meeting their needs in captivity is challenging. These standards should help inspectors and others in assessing the extent to which these welfare needs are being met, and in particular, in assessing the welfare needs of individual elephants and the measures being taken to secure good elephant welfare.

8.8.2 Inspectors, local authorities and zoos should also consult the current *Management Guidelines for the Welfare of Zoo Animals: Elephants* (BIAZA). Elephant-keeping zoos must engage constructively with the Elephant Welfare Group (administered by BIAZA), which may include assisting with monitoring and recording welfare and other parameters, to help the Group monitor progress in the national herd.

The captive environment

Social structure

8.8.3 African and Asian elephants should never be mixed in the same social grouping.

Cows

8.8.4 Elephants should be kept in stable, female groups, preferably of related animals. Matriarchal herds should be the norm. However zoos which need to keep herds of unrelated, non-productive, older or problem elephants should also comply with these Standards.

8.8.5 Female elephants must have social contact with other elephants at all times. Ideally a group should contain at least four cows over two years old, and have unrestricted access to each other not less than 16 hours in any 24 hour period. The routine and prolonged separation of cows is unacceptable and zoos should keep records of such periods, the reasons for this separation, the action being taken to re-introduce these elephants and the timeframe for doing so. Such records should be made available to zoo inspectors upon request.

Bulls

8.8.6 Bull elephants can be difficult to manage (particularly in musth) and are not always compatible with cows. Provision must be made for them to be separated from cows and other bulls when necessary, however bulls are also highly social and it is not acceptable to subject them to prolonged physical and social isolation from other elephants. Therefore they should be run with the herd whenever possible. A profile should be drawn up for each bull and should be reviewed (in combination with a risk assessment) at least every six months. A management regime should be drawn up and modified in the light of the development of the elephant's character. All collections keeping bulls should have the facility to carry out any essential veterinary procedure in such a way that is safe for all staff and the elephant concerned (e.g. Elephant Restraint Device). All collections keeping bulls

must ensure that staff are adequately trained to work with bulls (see current BIAZA Guidelines).

8.8.7 Calves have a long learning period and must be brought up in a matriarchal group. Female elephants must learn calf care and benefit from the presence of a young animal. Cows should generally stay with their maternal herd, while bulls may need to be removed if their presence is no longer tolerated. The age will vary with individuals, herd structure and facilities. The social development of young bulls is also increasingly recognised as being very important, benefiting from the presence of older, adult males; and this must not be overlooked.

Enclosures

8.8.8 Indoor and outdoor accommodation must be provided and other than in exceptional weather conditions, elephants should have access to both over a 24 hour period and be able to choose where they spend their time.

8.8.9 The indoor and outdoor environment should be positively challenging and stimulating to the animals and contain devices and structures which enrich the environment and encourage natural behaviour including, for example moving around, dustbathing, bathing, scratching, digging and exploration.

8.8.10 Indoor enclosures should provide a minimum of 200 sq.m for four (or fewer) animals and should increase by 80 sq.m for each additional animal over two years old. Separation and isolation facilities (ie separate pens) must be provided for veterinary and behaviour management purposes. The indoor stall size for a bull must be at least 80 sq.m and should take into account that a mature bull can reach vertically up to six metres. Ceilings, plumbing and electrical installations etc must be out of reach.

8.8.11 Indoor enclosures must allow for elephants to move freely as a group, turn and lie down. The enclosures must be well ventilated but at low velocity to avoid draughts and must be well lit, preferably with natural sky-lights and the ability to fade the lighting to minimise disturbance to the elephants. The inside temperature should be no less than 16C with an area able to be maintained at 21C for sick or debilitated animals.

8.8.12 Concrete flooring for indoor enclosures can cause foot and joint problems for elephants so enclosures should use alternative substrates such as sand or woodchip. There is increasing evidence that deep sand is the preferred substrate and is therefore recommended. Other flooring should be quick-drying, well-drained and able to be readily cleaned and disinfected. It should be relatively smooth but not slippery and with a degree of 'give' so that elephants can lie down comfortably.

8.8.13 Outdoor enclosures must be as large as possible and encourage walking (and also exploration, foraging, social interaction and maintenance behaviours (e.g.dust-bathing). The minimum size for eight animals (i.e. females over two years) or fewer is 2,000 sq.m and another 200 sq.m added for every additional animal. Outdoor areas for bulls and cows should provide a minimum of 3,000 sq.m. Enclosures must be flexible and allow for separation where needed.

8.8.14 The outdoor area must be protected from extremes of sunlight, wind and rain i.e sufficient shelter areas must be provided.

8.8.15 Outside substrates must be primarily natural e.g. soil, sand or grass with good drainage. A combination of an all weather substrate (such as sand or hardstanding) and a softer substrate (sand or soil) is recommended to help promote foot pad and toenail wear.

8.8.16 Elephants must be provided with the opportunity to bathe and enclosures should incorporate a pool, dust baths and mud wallows. A pool should be large enough to accommodate the needs of all the animals. It must have gentle entry slopes with non-slip surfaces.

Boundaries

8.8.17 Barriers must prevent escapes and direct contact with the public and must also ensure the safety and well-being of both the elephants and staff. Methods of quick escape must be provided for keepers.

8.8.18 Barriers and gates should not have horizontal bars, which would allow elephants to climb. The minimum height is 1.9m for cows and 2.5m for bulls. A large bull may require a 3m barrier. Safety corridors and stand-off areas must be at least 4m wide.

8.8.19 Gates should be robust and any hydraulic system should have manual back-up and/or alternative power. Gates must be capable of being operated remotely by staff i.e outside the area within elephant reach, and must be able to be opened and closed quickly with a stop facility to ensure trunks/tails are not crushed.

8.8.20 Electric fences used as a secondary barrier must be of sufficient voltage to deter elephants and must have a failsafe alarm system. Electric fences should not normally be used as a main barrier, but where they remain, suitably trained staff must be present, directly supervising the animals. Moats are not suitable as barriers and should not be used.

Feeding and nutrition

8.8.21 Feeding should match natural feeding activity as much as possible, where browse accounts for the majority of the diet. Elephant diet should be high in fibre and low in nutrients with browse and hay comprising at least 70% and the remaining 30% comprising pellets and other foodstuffs.

8.8.22 Sufficient browse should be available to all elephants in sufficient quantities to allow foraging and feeding to occupy at least 16 hours a day. It must be provided every day and distributed around the enclosure to encourage walking. Forage must be of appropriate quality and analysed by appropriate laboratories to ensure it remains within nutritional guidelines. Elephants should be fed in small amounts, repeatedly throughout the day and in the evening and early morning. There must also be a means of providing food during the night.

8.8.23 Food that gives readily digestible energy such as grains, bread, fruit, vegetables and low-fibre pellets should not be used in bulk as they can cause unnecessary weight gain. Food used as treats should be factored into the overall diet formulation.

8.8.24 Animals must have access to clean drinking water at all times from the indoor and the outdoor areas.

8.8.25 A nutritional plan must be drawn up and maintained for each elephant, the elephant monitored regularly and the diet and food presentation modified when needed.

Behavioural management

8.8.26 The individual behaviour of elephants must be continually monitored and assessed (see Appendix 4: Elephant Profiles in the current *Management Guidelines for the Welfare of Zoo Animals: Elephants* (BIAZA)).

8.8.27 Extensive and varied enrichment must be provided in both the inside and outside environments and be part of the daily routine. It must be a continuous process, carried out each day as an integral part of the management programme, and records must be kept and made available to inspectors upon request.

Healthcare

8.8.28 A healthcare/welfare plan must be drawn up, monitored and reviewed/updated at least quarterly (but the appropriate frequency to be established in the light of the individual health needs), for each elephant. It must include:

(i) baseline information on its state of health;

(ii) behavioural issues, including stereotypy;

(iii) health checks, including foot health; and locomotion including gait and lameness;

(iv) exercise and measures taken to encourage it;

(v) weight and body condition score.

8.8.29 The plan should record any health and welfare problems identified, the steps taken to address them and the improvements achieved.

8.8.30 General health should be assessed regularly and should form part of the daily routine.

Staff training

8.8.31 Risks should be effectively managed through the process of risk assessments and should include the installation of elephant facilities that are appropriate for the bulls and cows managed by the institution. Risk assessments must include all management procedures used e.g. free and protected contact and take into account the working of each staff member with each elephant.

8.8.32 A collection must have a monitored and written staff training programme. This must encompass training of new staff and training reviews of existing staff and also must include the outcomes from all the risk assessment that have been carried out.

8.8.33 There must be a recognized 'group' of elephant handlers, who work as a team. This team must have a structure which includes a team leader, who is responsible for ensuring that agreed protocols, procedures and training are correctly carried out and implemented.

8.8.34 Trainees must work alongside two fully trained members of staff until they are deemed competent when working with elephants. There should be an elephant management training programme with an evaluation suitable for each level of training (see Appendix 5: Staff Training in the current *Management Guidelines for the Welfare of Zoo*

Animals: Elephants (BIAZA). Members of staff should continuously update their training to ensure they continue to adopt best practice.

Use of chains and shackles

8.8.35 Physical restraint of elephants through the use of chains and shackles must be minimised. There are sound safety and husbandry/welfare management reasons for its continuation at present but the consequences of bad practice are significant and severe. There is justification for limited periods of chaining for certain husbandry and veterinary procedures.

8.8.36 All chains and shackling equipment must be maintained to the highest standard and replaced immediately if damaged or showing signs of wear and tear.

8.8.37 Written, generic approval of routine chaining must be given by senior management in a zoo. In addition the parameters of exceptional chaining must be defined.

8.8.38 Elephants must not be chained for periods in excess of three out of 24 hours.

8.8.39 Only named, trained persons may carry out chaining. This may include elephant experts brought in for staff training and/or elephant transportation. Any unplanned variations from routine practice must be documented and management notified.

8.8.40 Keepers must be adequately trained in the procedure and safety aspects followed.

Ankus or hook

8.8.41 The ankus is a tool used to cue the elephant to maintain commands and train them. It must be used only by staff who have had appropriate training. Correct use of the ankus will not break the skin or cause any kind of physical or mental injury. The handle of the ankus must never be used to hit an elephant. All injuries caused by an ankus must be reported in an incident book, reviewed by management and be made available to inspectors.

Electric goad

8.8.42 Electric goads must only ever be used to protect human safety in extreme situations and never as a way of controlling the animal to ensure compliance. Goads may be used only by staff that have had appropriate training. In all cases where an electric goad has been used, a full report must be produced detailing the situation and circumstances of its use. The report must be reviewed by management and be made available to inspectors.

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;
- educational techniques

Staff

9.2 The zoo operator must make every effort to ensure that their 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:

- Animal Welfare Act 2006;
- Pet Animals Act 1951;
- Animal Boarding Establishments Act 1963;
- Riding Establishments Act 1964;
- Riding Establishments Act 1970;
- Breeding and Sale of Dogs (Welfare) Act 1999;
- Dangerous Wild Animals Act 1976;
- Wildlife and Countryside Act 1981;
- Control of Trade in Endangered Species (Enforcement) Regulations 1997;
- Conservation of Habitats and Species Regulations 2010.

Appendix 10 - Pre Inspection Audit Form

Appendix 11 - Inspection Report Form

Appendix 11A - Licence Inspection Form

These appendices can be viewed and downloaded from the following website:
http://animalhealth.defra.gov.uk/cites/zoos-inspectorate.html

Appendix 12 - Hazardous animal categorisation

Animal kinds, with respect to danger to members of the public visiting zoological gardens

Zoo animals are categorized in the following list into 3 risk levels on the basis of the animal's likely ferocity and ability to cause harm to people, and the scale of harm if it should do so:

Category '1' (greater risk)

1.1 Contact between the public and animals in Category '1' is likely to cause serious injury or be a serious threat to life, on the basis of hazard and risk of injury, toxin or disease, irrespective of the age and vulnerability of the visitor.

1.2 Animals in Category '1' 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 local authority, be 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 local 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 has satisfied the local 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 Contact between the public and animals in Category '2' may result in injury or illness, on the basis of hazard and risk of injury, toxin or disease, but is not likely to be life threatening.

2.2 Animals in Category '2' 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' animals, 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 local authority, citing relevant experience, that it is reasonable that

the species involved can be safely exhibited in the manner proposed. The operator must also be able to satisfy the local 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 a Category '2' animal 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 it were in Category '1'.

Category '3' (least risk)

3.1 All animals not listed in Category '1' or Category '2' are automatically in Category '3'. This does not necessarily mean that they do not present a hazard or risk to members of the public. This category contains many taxa in respect of which knowledge and experience of captivity is currently lacking. The zoo operator should, therefore, carry out a risk assessment to determine the appropriate barrier.

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

Notes

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

Note 2: The list will act as an aid to inspectors in determining whether a barrier is appropriate for a particular species or individual. It should also aid zoo operators in carrying out risk assessments on barrier types from a public safety perspective, which should be done in accordance with guidance issued by the Health and Safety Executive in their publication – Managing Health and Safety in Zoos. Risk assessments should reflect the peculiarities of any particular animal kept, irrespective of the categorisation afforded to its species in this list, and should take into account the potential for theft or actions of unbalanced members of the public.

Note 3: Animals in Category '1' may only be exhibited to the public in the absence of non-touch barriers with the prior approval of the local authority.

Note 4: Category '2' animals may, under certain circumstances, be exhibited to the public in the absence of non-touch barriers. Although prior approval by the local authority is not required, the operator of the zoological garden must be able to provide the local 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 Expert Committee (who may if necessary, consult the British and Irish Association of Zoos and Aquariums).

Note 5: 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, and free-flying demonstrations), the details of the practices being followed must be recorded in writing and be made available to the inspectors under the Act and the local authority, at the time of any subsequent inspection.

Note 6*: The likelihood of bites, pecks, scratches, etc. caused by any individual animal which is in unusual circumstances (for example which is being injudiciously handled, or cornered thereby affecting its behaviour) is not to be taken as a measure of the natural ferocity of a species.

* This is mentioned so that species aren't considered overly hazardous on the basis of anecdotal reports of behaviour under such circumstances.

Note 7: 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 8: 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 local authority (see 1.3, 1.4 and note 3 above). In any event, zoo operators are reminded to carry out risk assessments if treating any individuals differently from the category to which they are assigned in this list.

Note 7: The list below includes all those kinds of mammals, birds, reptiles, amphibians, fish and invertebrates that are thought to present significant hazards in zoological gardens and aquaria (ie those falling within Categories '1' and '2'). Any variation in classification and nomenclature may not be taken to imply that the categorisation of a species has changed. The barrier for any taxa not listed in either Category '1' or '2' must be determined by the zoo operator on the basis of risk assessments, which should be open to scrutiny by inspectors.

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

Note 9: Animals normally domesticated in Britain have not been included in this list. Attention is drawn to the possibility that individuals of such species may be very dangerous.

Note 10: Where categorization is of a taxon of animals, e.g. the genus *Cacatua*, the categorization has been made on the basis of the highest risk species within that taxon.

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. Such birds should, when unsupervised, be separated by a non-touch barrier from members of the public.

Note 12: Attention is drawn to the hazard of all zoonotic infections, but with particular emphasis on 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.

Note 13: 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 14: Attention is drawn to the possible 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.

Note 15: In the listings below the following abbreviations apply: Special Electric Risk (E); Special Kicking Risk (K); Special Pecking Risk (P); Special Venom Risk (V).

Categorisations and listings

Risk category (if not listed, taxon is in Category 3)

Mammals

		Risk Category
Order MARSUPIALIA		
Family Didelphidae		
Metachirus	Brown Four-eyed Opossums	2
Didelphis	Large Opossums	2
Metachirops	Philanders or Four-eyed Opossums	2
Lutreolina	Thick-tailed Opossum	2
Chironectes	Yapok or Water Opossum	2
Family Dasyuridae		
Dasyurus	Quolls & Native Cats	2
Sarcophilus	Tasmanian Devil	1
Dasyuroides	Kowari	2
Family Phalangeridae		
Trichosurus	Brush-tailed Possums	2
Family Macropodidae		

Macropus rufus	Red Kangaroo	1 K
M. giganteus	Great Grey Kangaroo	1 K
M. fuliginosus	Western Grey Kangaroo	1 K
M. robustus	Wallaroo or Euro	1 K
M. antilopinus	Antelope Kangaroo	2
Family Phascolarctidae		
Phascolarctos	Koala	2
Family Vombatidae		
Vombatus	Common Wombat	2
Lasiorhinus	Hairy-nosed Wombat	2
Order INSECTIVORA		
Family Solenodontidae		
Solenodon	Solenodons	2
Family Erinaceidae		
Echinosorex	Moonrat	2
Hylomys	Lesser Moonrat	2
Podogymnura	Mindanao Moonrat	2
Neohylomys	Hainan Moonrat	2
Order CHIROPTERA		
Family Pteropodidae	Fruit bats	2
Family Desmodontidae (Vampire Bats)		
Desmodus		1
Diaemus		1
Diphylla		1
Order PRIMATES		
Family Lemuridae		
Lemur	Lemurs	2
Hapalemur	Gentle Lemur	2
Varecia	Ruffed Lemur	2
Lepilemur	Weasel & Sportive Lemurs	2
Family Indriidae		
Avahi	Woolly Indri	2
Propithecus	Sifakas	2
Indri	Indri	2
Family Daubentoniidae		

Daubentonia	Aye-Aye	2
Family Callitrichidae (Marmosets & Tamarins)		
Callithrix		2
Cebuella		2
Saguinus		2
Leontopithecus		2
Callimico		2
Family Cebidae		
Cebus	Capuchin Monkeys	1
Aotus	Douroucouli	2
Callicebus	Titis	2
Saimiri	Squirrel Monkey	2
Pithecia	Sakis	2
Cacajao	Uakaris	2
Chiropotes	Bearded Sakis	2
Alouatta	Howler Monkeys	1
Ateles	Spider Monkeys	1
Brachyteles	Woolly Spider Monkeys	1
Lagothrix	Woolly Monkeys	1
Family Cercopithecidae		
Macaca	Macaques	1
Cercocebus	Mangabeys	1
Papio	Baboons	1
Mandrillus	Mandrill	1
Theropithecus	Gelada	1
Cercopithecus	Guenons	1
Miopithecus	Talapoin Monkey	2
Allenopithecus	Allen's Monkey	1
Erythrocebus	Patas Monkey	1
Sub-family Colobinae		
Colobus	Colobus Monkeys	1
Procolobus	Red & Olive Colobus Monkeys	1
Pygathrix	Snub-nosed & Douc Monkeys	1
Nasalis	Proboscis Monkeys	1
Presbytis	Surelis	1

Semnopithecus	Langurs & Leaf Monkeys	1
Family Pongidae		
Hylobates	Gibbons	1
Pongo	Orang-utan	1
Pan	Chimpanzees	1
Gorilla	Gorilla	1
Order EDENTATA		
Family Myrmecophagidae		
Myrmecophaga	Giant Ant-eater	1
Tamandua	Tamanduas	2
Family Bradypodidae		
Bradypus	Three-toed Sloths	1
Choloepus	Two-toed Sloths	1
Family Dasypodidae		
Priodontes	Giant Armadillo	2
Order RODENTIA		
Sub-order Sciuromorpha		
Family Sciuridae		
Ratufa	Giant Squirrels	2
Family Castoridae		
Castor	Beavers	2
Sub-order Hystricomorpha		
Family Hystricidae		
Thecurus	Indonesian Porcupines	2
Hystrix	Crested Porcupines	2
Atherurus	Brush-tailed Porcupines	2
Trichys	Long-tailed Porcupine	2
Family Erethizontidae		
Erethizon	North American Porcupine	2
Coendou	Tree Porcupines	2
Echinoprocta	Amazon Porcupine	2
Chaetomys	Thin-spined Porcupine	2
Family Hydrochoeridae		
Hydrochoerus	Capybara	2
Family Dinomyidae		

Dinomys	Pacarana	2
Family Dasyproctidae		
Cuniculus	Pacas	2
Family Capromyidae		
Capromys	Hutias	2
Plagiodontia	Hispaniola Hutia	2
Myocastor	Coypu	2
Order CARNIVORA		
Family Canidae		
Canis (wild species only)		
C. lupus	Wolf	1
C. species	Coyote, Jackals	2
Alopex	Arctic Fox	2
Vulpes	Common Foxes	2
Dusicyon	South American Foxes	2
Nyctereutes	Raccoon Dog	2
Chrysocyon	Maned Wolf	2
Speothos	Bush Dog	2
Cuon	Dhole	2
Lycaon	Hunting Dog	1
0tocyon	Bat-eared Fox	2
Family Ursidae		
Tremarctos	Spectacled Bear	1
Selenarctos	Asiatic Black Bear	1
Ursus	Brown & American Black Bears	1
Thalarctos	Polar Bear	1
Helarctos	Sun Bear	1
Melursus	Sloth Bear	1
Family Procyonidae		
Bassariscus	Cacomistle & Ringtail	2
Procyon	Raccoons	2
Nasua	Coatis	2
Nasuella	Mountain Coati	2
Potos	Kinkajou	2
Bassaricyon	Olingo	2

Family Ailuropodidae		
Ailurus	Red Panda	2
Ailuropoda	Giant Panda	1
Family Mustelidae		
Mustela	Minks, Stoats, Weasels	2
Vormela	Marbled Polecat	2
Martes	Martens	2
Eira	Tayra	2
Galictis	Grison	2
Lyncodon	Patagonian Weasel	2
Ictonyx	Zorilla	2
Poecilictis	Libyan Weasel	2
Poecilogale	White-naped Weasel	2
Gulo	Wolverine or Glutton	1
Mellivora	Ratel	1
Meles	Badger	2
Arctonyx	Hog Badger	2
Mydaus	Malay Badger	2
Taxidea	American Badger	2
Melogale	Ferret Badgers	2
Mephitis	Skunks	2
Spilogale	Spotted Skunks	2
Conepatus	Hog-nosed & South American Skunks	2
Lutra	Otters	1
Pteronura	Giant Otter	1
Aonyx	Small-clawed Otters	1
Enhydra	Sea Otters	1
Family Viverridae		
Poiana	African Linsang	2
Genetta	Genets	2
Viverricula	Small Indian Civet	2
0sbornictis	Water Civet	2
Viverra	Civets	2
Prionodon	Asiatic Linsangs	2
Nandinia	African Palm Civet	2

Arctogalidea	Small-toothed Palm Civet	2
Paradoxurus	Palm Civets	2
Paguma	Masked Palm Civet	2
Macrogalidea	Brown Palm Civet	2
Arctictis	Binturong	2
Fossa	Malagasy Civet	2
Cryptoprocta	Fossa	1
Hemigalus	Banded Palm Civet	2
Chrotogale	Owston's Civet	2
Cynogale	Otter Civets	2
Eupleres	Falanouc	2
Galidea	Malagasy Mongoose	2
Galidictis	Malagasy Mongooses	2
Mungotictis	Malagasy Mongooses	2
Salanoia	Malagasy Mongooses	2
Suricata	Meerkat or Suricate	2
Herpestes	Mongooses	2
Helogale	Dwarf Mongoose	2
Dologale	Dwarf Mongoose	2
Atilax	Marsh Mongoose	2
Mungos	Banded Mongoose	2
C*rossarchus*	Kusimanse	2
Liberiictis	Kuhn's Kusimanse	2
Ichneumia	White-tailed Mongoose	2
Bdeogale	Mongooses	2
Rhynchogale	Mongoose	2
Cynictis	Yellow Mongoose	2
Paracynictis	Selous' Meerkat	2
Family Hyaenidae		
Proteles	Aardwolf	2
Crocuta	Spotted Hyaena	1
Hyaena	Hyaenas	1
Family Felidae		
Felis		
F. concolor	Puma	1

F. species	(wild species) Wild Cats, Lynxes	1
Panthera	Lion, Tiger, Leopards, Jaguar	1
Neofelis	Clouded Leopard	1
Acinonyx	Cheetah	1
Order PINNIPEDIA		
Family Otariidae		
Arctocephalus	Fur Seals	1
Callorhinus	Northern Fur Seal	1
Zalophus	California Sealion	1
Eumetopias	Steller's Sealion	1
Otaria	Southern Sealion	1
Neophoca	Australian Sealion	1
Family Odobenidae		
Odobenus	Walrus	1
Family Phocidae		
Phoca	Common, Ringed, Caspian & Baikal Seals	1
Histrophoca	Ribbon Seal	1
Pagophilus	Harp Seal	1
Halichoerus	Grey Seal	1
Erignathus	Bearded Seal	1
Lobodon	Crab-eating Seal	1
Ommatophoca	Ross Seal	1
Hydrurga	Leopard Seal	1
Leptonychotes	Weddell Seal	1
Monachus	Monk Seals	1
Mirounga	Elephant Seals	1
Cystophora	Hooded Seal	1
Order TUBULIDENTATA		
Family Orycteropidae		
Orycteropus	Aardvark	2
Order HYRACOIDEA		
Family Procaviidae		
Dendrohyrax	Tree Hyraxes	2
Heterohyrax	Bush Hyraxes	2
Procavia	Rock Hyraxes	2

Order PROBOSCIDEA		
Family Elephantidae		
Loxodonta	African Elephant	1
Elephas	Asian Elephant	1
Order PERISSODACTYLA		
Family Equidae		
Equus	(wild species) Wild Horses, Asses & Zebras	1
Family Tapiridae		
Tapirus	Tapirs	2
Family Rhinocerotidae		
Rhinoceros	Asiatic Rhinoceroses	1
Dicerorhinus	Sumatran Rhinoceros	1
Ceratotherium	White Rhinoceros	1
Diceros	Black Rhinoceros	1
Order ARTIODACTYLA		
Family Suidae		
Potamochoerus	Bush Pig	1
Sus	(wild species) Wild Boar	1
Phacochoerus	Wart Hog	1
Hylochoerus	Giant Forest Hog	1
Babyrousa	Babirusa	1
Family Tayassuidae		
Tayassu	Peccaries	1
Catagonus	Chaco Peccary	1
Family Hippopotamidae		
Hippopotamus	Hippopotamus	1
Choeropsis	Pygmy Hippopotamus	1
Family Camelidae		
Lama		
L. guanicoe	Guanaco	2
L. glama	Llama	2
L. pacos	Alpaca	2
Vicugna	Vicuna	2
Camelus	Camels	1
Family Cervidae		

Cervus		
(larger species)	Red Deer, Wapiti, Sika Deer	1
(other species)	Fallow Deer, etc.	
	(adult males)	1
	(females and young)	2
Elaphurus	Pere David's Deer	1
Alces	Moose, European Elk	1
Rangifer	Caribou, Reindeer	
	(adult males)	1
	(females and young)	2
0docoileus	Mule Deer, White-tailed Deer	2
Blastocerus	Marsh Deer	2
Ozotoceros	Pampas Deer	2
Hippocamelus	Guemals	2
Mazama	South American Brockets	2
Capreolus	Roe Deer	
	(adult males)	1
	(females and young)	2
Family Giraffidae		
Okapia	Okapi	2
Giraffa	Giraffe	1
Family Antilocapridae		
Antilocapra	Pronghorn Antelope	2
Family Bovidae		
Tragelaphus	Nyalas, Bushbuck, Sitatunga, Kudus, Bongo	
	(adult males)	1
	(females and young)	2
Taurotragus	Eland , Giant Eland	1
Boselaphus	Nilghai	2
Tetracerus	Four-horned Antelope	2
Bubalus	Anoas, Tamarau, Water Buffalo	1
Bos	(wild and larger exotic domestic species)	
	Ankole, Banteng, Gaur, Yak, Kouprey	1
	others	2
Synceros	African Buffalo	1

Bison	American Bison, Wisent	1
Kobus		
K. ellipsiprymnus	Common Waterbuck	
	(adult males)	1
	(females & young)	2
K. defassa	Defassa Waterbuck	
	(adult males)	1
	(females & young)	2
K. kob	Kob	
	(adult males)	1
	(females & young)	2
K. leche	Red Lechwe	
	(adult males)	1
	(females & young)	2
K. megaceros	Nile Lechwe	
	(adult males)	1
	(females and young)	2
K. vardoni	Puku	2
Cephalophus	Duikers	2
Sylvicapra	Common Duiker	2
Redunca	Reedbuck	2
Pelea	Rhebok	2
Hippotragus		
H. niger	Sable Antelope	
	(adult males)	1
	(females and young)	2
H. equinus	Roan Antelope	
	(adult males)	1
	(females and young)	2
Oryx	Oryxes and Gemsbok	1
Addax	Addax	2
Connochaetes	Wildebeests or Gnus	1
Alcelaphus	Hartebeests	2
Damaliscus	Bontebok, Blesbok, Topi, & Hunter's Hartebeest	2

Aepyceros	Impala	2
Antilope	Blackbuck	2
Antidorcas	Springbok	2
Litocranius	Gerenuk	2
Ammodorcas	Dibatag	2
Gazella	Gazelles	2
Procapra	Chinese Gazelles	2
Pantholops	Tibetan Antelope or Chiru	2
Saiga	Saiga	2
Nemorhaedus	Goral	2
Capricornis	Serows	2
Oreamnos	Rocky Mountain Goat	2
Rupicapra	Chamois	2
Ovibos	Musk Ox	1
Budorcas	Takins	2
Hemitragus	Tahrs	
	(adult males)	1
	(females and young)	2
Capra	(wild species) Tur, Markhor, Ibex, Wild Goats	
	(adult males)	1
	(females and young)	2
Ammotragus	Aoudad or Barbary Sheep	1
Pseudois	Bharal	2
Ovis	(large wild species) Argali, Bighorn	1
	(small wild species) Mouflon, Urial	2
Order CETACEA		
Family Delphinidae		
Pseudorca	False Killer Whale	1
Orcinus	Killer Whale	1
Grampus	Risso's Dolphin	2
Globicephala	Pilot Whales	2
Feresa	Pygmy Killer Whale	1
Family Monodontidae		
Monodon	Narwhal (adult males)	2
Family Physeteridae		

Kogia	Pygmy Sperm Whales	2
Family Ziphiidae		
Tasmacetus	Tasman whale	2
Berardius	Arnoud's & Baird's Beaked Whales	2
Mesoplodon	Beaked Whales	2
Ziphius	Cuvier's Beaked Whale	2
Hyperoodon	Bottle-nosed Whales	2

Birds

Order STRUTHIONIFORMES		
Family Struthionidae		
Struthio	Ostrich	1
Order RHEIFORMES		
Family Rheidae		
Rhea	Common Rhea	2
Pterocnemia	Darwin's Rhea	2
Order CASUARIIFORMES		
Family Casuariidae		
Casuarius	Cassowaries	1
Family Dromaiidae		
Dromaius	Emu	2
Order PELECANIFORMES		
Family Pelecanidae		
Pelecanus		
P. conspicillatus	Australian Pelican	2
P. crispus	Dalmatian Pelican	2
P. erythrorhynchus	American White Pelican	2
P. occidentalis	Brown Pelican	2
P. onocrotalus	Great White Pelican	2
Order CICONIIFORMES		
Family Ardeidae		
Ardea		
A. cinerea	Grey Heron	2 P
A. herodias	Great Blue Heron	2 P
	(includes Great White Heron)	2 P

A. purpurea	Purple Heron	2 P
A. goliath	Goliath Heron	2 P
A. imperialis	Great White-bellied Heron	2 P
Egretta		
E. alba	Large (Great) Egret	2
Family Ciconiidae		
Mycteria	Wood Stork	2 P
Ibis	Painted Storks (NB not Ibises)	2 P
Anastomus	Open-bill Storks	2 P
Ciconia		
C. ciconia	White Stork	2 P
C. episcopus	White-necked Stork	2 P
C. nigra	Black Stork	2 P
Euxenura	Maguari Stork	2 P
Xenorhynchus	Black-necked Stork	2 P
Ephippiorhynchus	Saddle-billed Stork	2 P
Jabiru	Jabiru	2 P
Leptoptilos	Marabou and Adjutant Storks	2 P
Order ANSERIFORMES		
Family Anhimidae	Screamers	2
Family Anatidae	Geese, Swans and Ducks	
Plectopterus	Spurwinged Goose	2
Order FALCONIFORMES		
Family Cathartidae		
Cathartes	Turkey & Yellow-headed Vultures	2
Coragyps	Black Vulture	2
Sarcorhamphus	King Vulture	2
Vultur	Andean Condor	1
Gymnogyps	Californian Condor	1
Family Pandionidae		
Pandion	Osprey	2
Family Accipitridae		
Spilornis	Serpent Eagles	2
Aviceda	Cuckoo Falcons & Lizard Hawks	2
Leptodon	Gray-Headed Kite	2

Chondrohierax	Hook-billed Kite	2
Henicopernis	Long-tail & Black Honey Buzzards	2
Pernis	Honey Buzzards	2
Elanoides	Swallow-tailed Kite	2
Macheirhamphus	Bat Hawk	2
Gampsonyx	Pearl Kite	2
Elanus	Kites	2
Rostrhamus	Kites	2
Harpagus	Kites	2
Ictinia	Kites	2
Lophoictinia	Square-tailed Kite	2
Hamirostra	Black-breasted Buzzard	2
Milvus	Black & Red Kites	2
Haliastur	Brahminy & Whistling Kites	2
Haliaeetus	Bald, Sea & Fish Eagles	2
Ichthyophaga	Grey-headed Fishing Eagle	2
Gypohierax	Palm-nut Vulture	2
Neophron	Hooded & Egyptian Vultures	2
Gypaetus	Bearded Vulture	2
Gyps	Vultures and Griffon Vultures	1
Sarcogyps	Indian Black Vulture	2
Aegypius	European Black Vulture	1
Torgos	Lappet-faced Vultures	1
Trigonoceps	White-headed Vulture	2
Circaetus	Snake Eagles	2
Terathopius	Bateleur	2
Dryotriorchis	Congo Snake Eagle	2
Eutriorchis	Madagascar Serpent Eagle	2
Polyboroides	African Harrier Hawk	2
Geranospiza	Crane Hawk	2
Circus	Harriers	2
Melierax	Chanting Goshawks	2
Megatriorchis	Doria's Hawk	2
Erythrotriorchis	Red Goshawk	2
Accipiter	Hawks, Sparrow Hawks & Goshawks	2

Urotriorchis	African Long-tailed Hawk	2
Butastur	Grey-faced Buzzard-Eagle	2
Kaupifalco	Lizard Buzzard	2
Leucopternis	Hawks	2
Buteogallus	Hawks	2
Harpyhaliaetus	Solitary Eagle	2
Heterospizias	Savannah Hawk	2
Busarellus	Black-collared Hawk	2
Geranoaetus	Black-chested Buzzard-Eagle	2
Parabuteo	Harris Hawk	2
Buteo	Buzzards	2
Morphnus	Crested Eagle	2
Harpia	Harpy Eagle	1
Harpyopsis	New Guinea Harpy Eagle	1
Pithecophaga	Monkey-eating Eagle	1
Ictinaetus	Black Eagle	2
Aquila	Eagles	2
Hieraaetus	Eagles	2
Spizastur	Black-and-white Hawk-Eagle	2
Lophaetus	Long-crested Eagle	2
Spizaetus	Hawk-Eagles	2
Stephanoaetus	Crowned Eagle	1
Oroaetus	Black-and-Chestnut Eagle	2
Polemaetus	Martial Eagle	1
Family Sagittariidae		
Sagittarius	Secretary Bird	2
Family Falconidae		
Daptrius	Caracaras	2 P
Phalcobaenus	Caracaras	2 P
Polyborus	Crested Caracara	2 P
Milvago	Milvago Caracaras	2 P
Herpetotheres	Laughing Falcon	2
Micrastur	Forest Falcons	2
Spiziapteryx	Spot-winged Falconet	2
Microhierax	Falconets	2

Falco	Kestrels and Falcons	2
Order GRUIFORMES		
Family Gruidae		
Grus	Cranes	2 P
Anthropoides	Blue & Demoiselle Cranes	2 P
Balearica	Crowned Crane	2 P
Family Otididae		
Ardeotis	Kori and Large Bustards	2
Chlamydotis	Houbara Bustard	2
Order CHARADRIIFORMES		
Family Stercorariidae		
	Skuas	2
Order PSITTACIFORMES		
Family Psittacidae		
Probosciger	Palm Cockatoo	2
Calyptorhynchus	Cockatoos	2
Callocephalon	Gang-gang Cockatoo	2
Eolophus	Galah	2
Cacatua	Cockatoos and Corellas	2
Nestor	Kaka & Kea	2
Strigops	Kakapo	2
Coracopsis	Vasa Parrots	2
Psittacus	African Grey Parrot	2
Anodorhynchus	Hyacinthine & Indigo Macaws	2
Cyanopsitta	Little Blue Macaw	2
Ara	Macaws	2
Amazona	Amazon Parrots	2
Order STRIGIFORMES		
Family Tytonidae		
Tyto	Barn Owls	2
Phodilus	Bay Owls	2
Family Strigidae		
Bubo	Eagle-Owls:	
	(adults breeding or with young)	1
	(other adults)	2

Ketupa	Fish Owls	2
Scotopelia	Fishing Owls	2
Pulsatrix	Owls	2
Sceloglaux	Laughing Owl	2
Nyctea	Snowy Owl	2
Surnia	Hawk-Owl	2
Micrathene	Elf Owl	2
Uroglaux	Papuan Hawk-Owl	2
Ninox	Booboks & Hawk-Owls	2
Athene	Little & Burrowing Owls	2
Ciccaba	Owls	2
Strix	Owls	2
Rhinoptynx	Striped Owl	2
Asio	Owls	2
Pseudoscops	Jamaican Owl	2
Nesasio	Fearful Owl	2
Aegolius	Whet-Owls	2
Order CAPRIMULGIFORMES		
Family Steatornithidae		
	Oilbird	2
Family Podargidae		
	Frogmouths	2
Family Aegothelidae		
	Owlet Nightjars	2
Family Caprimulgidae		
	Nightjars	2
Order CORACIIFORMES		
Family Bucerotidae		
Tockus	Hornbills	2
Berenicornis	White-crested Hornbills	2
Ptilolaemus	White-throated Brown Hornbill	2
Anorrhinus	Bushy-crested Hornbill	2
Penelopides	Hornbills	2
Aceros	Hornbills	2
Anthracoceros	Hornbills	2

Bycanistes	Hornbills	2
Ceratogymna	Black-casqued & Yellow-casqued Hornbills	2
Buceros	Hornbill	2
Rhinoplax	Helmeted Hornbill	2
Bucorvus	Ground Hornbills	1
Order PASSERIFORMES		
Family Corvidae		
Corvus		
C. albicollis	African White-necked Raven	2
C. corax	Raven	2
C. coronoides	Australian Raven	2
C. crassirostris	Thick-billed Raven	2
C. cryptoleucus	White-necked Raven	2
C. mellori	South Australian Raven	2
C. rhipidurus	Fan-tailed Raven	2
C. ruficollis	Brown-necked Raven	2

Reptiles

Order CHELONIA		
Family Chelidae		
Chelus	Matamata	2
Batrachemys	Snake-necked Turtles	2
Elseya	Australian Snapping Turtles	2
Family Chelydridae		
Chelydra	Snapping Turtle	1
Macroclemys	Alligator Snapping Turtle	1
Family Testudinidae		
Testudo		
T. elephantopus	Galapagos Giant Tortoise	2
T. gigantia	Aldabra Giant Tortoise	2
*T.*spp.	Common Tortoises	
	(over 0.3m. carapace length)	2
Family Cheloniidae		
Chelonia	Green Turtle	2
Eretmochelys	Hawksbill Turtle	2

Caretta	Loggerhead Turtle	2
Lepidochelys	Ridley Turtles	2
Family Carettochelyidae		
Carettochelys	Pitted-shell Turtle	2
Family Trionychidae		
Lissemys	Soft Terrapin	2
Cyclanorbis	Nubian & Senegal Softshell Turtles	2
Cycloderma	Aubrey's & Bridled Softshell Turtles	2
Chitra	River Softshell Turtles	2
Pelochelys	Softshell Turtles	2
Dogania	Softshell Turtles	2
Trionyx	Softshell Turtles	2
Order CROCODILIA		
Family Crocodylidae		
Crocodylus	Crocodiles	1
Osteolaemus	Dwarf Crocodiles	1
Tomistoma	False Gharial	1
Alligator	Alligators	1
Caiman	Caimans	1
Gavialis	Gharials	1
Order SQUAMATA		
Family Varanidae		
Varanus		
V. salvator	Water Dragon	2
V. niloticus	Nile Monitor	2
V. exanthematicus	Desert Monitor	2
V. komodoensis	Komodo Dragon	1
V. bengalensis	Bengal Monitor	2
V. varius	Variegated Monitor	2
V. giganteus	Giant Monitor	2
V. indicus	Mangrove Monitor	2
Family Helodermatidae		
Heloderma	Gila Monster and Beaded Lizard	1 V
Family Boidae	Pythons and Boas	
	all specimens over 3 m.	1

	all smaller specimens	2
Family Colubridae		
Rhabdophis	Yamakagashi	1 V
Thrasops	Black Tree Snakes	2
Hydrodynastes	False Water Cobra	2
Spilotes	Black and Yellow Rat Snake	2
Homalopsis	Water Snake	2
Enhydris	Water Snake	2
Boiga		
B. dendrophila	Mangrove Snake	1 V
B. irregularis	Brown tree snake	1 V
B. spp.	other Boigan species	2
Eteirodipsas	Madagascar Boigine Snake	2
Telescopus	European Boigine Snake	2
Macroprotodon	European Boigine Snake	2
Leptodeira	Cat-eyed Snake	2
Oxyrhopus	South American Boigine Snake	2
Clelia	Mussurana	1 V
Ahaetulla	Horizontal-pupilled or Asian Vine Snakes	2
Thelotornis	Twig Snake	2
Mapolon	Montpelier Snakes	1 V
Phylodryas		
P. olfersi	Green Boomslang	1 V
Psammophis	Swift Snakes	2
Dispholidus	Boomslang	1 V
Family Elapidae		
Ophiophagus	King Cobra	1 V
Naja	Cobras	1 V
Hemachatus	Ringhals	1 V
Pseudohaje	Cobras	1 V
Walterinnesia	Desert Black Snakes	1 V
Aspidelaps	Shield-nose Snakes	1 V
Elaps	African Cobras	1 V
Elapsoidea	African Cobras	1 V
Boulengerina	Water Cobras	1 V

Dendroaspis	Mambas	1 V
Bungarus	Kraits	1 V
Callophis	Oriental Coral Snakes	1 V
Maticora	Long-glanded Coral Snakes	1 V
Micrurus	Western Coral Snakes	1 V
Leptomicrurus	Slender Coral Snakes	1 V
Oxyuranus	Taipan	1 V
Acanthophis	Death Adder	1 V
Notechis	Australian Tiger Snakes	1 V
Pseudechis	Australian Black Snakes	1 V
Demansia	Australian Brown Snakes	1 V
Denisonia	Australian Copperheads	1 V
Family Laticaudidae		
Laticauda	Sea Kraits	1 V
Aipysurus	Olive-brown Sea Snake	1 V
Emydocephalus	Western Pacific Sea Kraits	1 V
Family Hydrophiidae		
Hydrophis	Sea Snakes	1 V
Enhydrina	Beaked Sea Snake	1 V
Lapemis	Sea snake	1 V
Pelamis	Yellow-bellied Sea Snake	1 V
Microcephalophis	Small-headed Sea Snakes	1 V
Family Viperidae		
Vipera	True Adders and Vipers	1 V
Azemiops	Fea's Viper	1 V
Echis	Saw-scaled Viper	1 V
Eristicophis	McMahon's Viper	1 V
Pseudocerastes	False Cerastes	1 V
Cerastes	Horned and Common Sand Vipers	1 V
Bitis	Puff Adders	1 V
Atheris	African Tree Vipers	1 V
Causus	Night Adders	1 V
Family Atractaspidae		
Atractaspis	Burrowing Vipers	1 V
Family Crotalidae		

Crotalus	Rattlesnakes	1 V
Sistrurus	Pygmy Rattlesnakes	1 V
Bothrops	Lance-head Snakes	1 V
Trimeresurus	Asian Lance-head Snakes	1 V
Lachesis	Bushmaster	1 V
Agkistrodon	Copperheads and Moccasins	1 V

Amphibians

Order CAUDATA		
Family Cryptobranchidae	Giant Salamanders	2
Family Amphiumidae	Congo eels (not Teleost Fish)	2
Order ANURA		
Family Ranidae		
Sub-family Dendrobatinae	Poison Arrow Frogs	
Phyllobates aurotaenia		1 V
Phyllobates bicolor		1 V
Phyllobates terribilis		1 V
Others in sub-family Dendrobatinae		2
Family Bufonidae	Toads	2

Fish

Class **Teleostomi** (Bony Fishes)

Order ANGUILLIFORMES		
Family Muraenidae	Moray Eels	1
Family Congridae	Conger Eels	2
Order SALMONIFORMES		
Family Esocidae	Pikes	2
Order CYPRINIFORMES		
Family Characidae		
Serrasalmus	Piranha	2
Family Electrophoridae	Electric Eel	1 E
Order SILURIFORMES		
Family Clariidae	Catfish	2
Family Malapteruridae	Electric Cat Fish	2
Family Ariidae	Sea Cat Fish	2

Family Plotosidae	Cat Fish		2
Order BATRACHOIDIFORMES			
Family Batrachoididae	Toad Fish		1 V
Order CHANNIFORMES			
Family Channidae	Snake Heads		2
Order SCORPAENIFORMES			
Family Scorpaenidae	Scorpion Fishes		1 V
Family Synanceidae	Stone Fish		1 V
Order PERCIFORMES			
Family Sphyraenidae	Barracudas		2
Family Trachinidae	Weever Fish		2
Family Uranoscopidae	Star-Gazers		1 V
Family Siganidae	Rabbit Fish (Teleost)		2
Order TETRAODONTIFORMES			
Family Balistidae	Trigger Fish	(larger specimens only)	2

Class **Elasmobranchiomorphii** (Cartilaginous Fishes)

Order ELASMOBRANCHII		
Family Hexanchidae	Comb-toothed Sharks	1
Family Odontaspididae	Sand Shark	1
Family Lamnidae Porbeagle	Shark	1
Family Orectolobidae	Carpet and Nurse Sharks	1
Family Carcharhinidae	Grey and Tiger Sharks	1
Family Alopiidae	Thresher Shark	1
Family Sphyrnidae	Hammerhead Sharks	1
Family Squatinidae	Monk Fish	2
Family Dasyatidae	Sting Rays	2
Family Myliobatida	Eagle Ray	2
Family Potamotrygonidae	Freshwater Sting Rays	1 V
Family Torpedinidae	Electric Rays	1 E
Order HOLOCEPHALI		
Family Chimaeridae	Rat Fish (Elasmobranch)	2

Invertebrates

MOLLUSCA

Class Cephalopoda		
Family Hapalochlaena		
H. maculosa	Blue-ringed Octopus	1 V
Class Gasteropoda		
Family Conidae	Cone shells (some species)	1 V

ARTHROPODA

Sub-Phylum CHELICERATA		
Class Arachnida		
Order ARANEAE		
Sub-Order Mygalomorphae		
Family Theridiidae		
Latrodectus	Black Widow or Redback Spiders	1 V
Family Sicariidae		
Loxosceles	Brown Recluse or Violin Spiders	1 V
Family Lycosidae		
Lycosa		
L. raptoria	Brazilian Wolf Spider	1 V
Family Hexathelidae		
Atrax	Australian funnel-web spiders	1 V
Family Ctenidae		
Phoneutria	Wandering Spiders	1 V
Family Theraphosidae	*B*ird-eating spiders or Tarantulas	2
Class Scorpionidea		
Family Buthidae	Buthid Scorpions	1 V
Family Scorpionidae		
Hemiscorpius lepturus		1 V
Scorpio maurus		1 V
Sub-phylum Mandibulata		
Class Chilopoda		
Order SCOLOPENDROMORPHA		
Family Scolopendridae	Giant Centipedes	2
Class Diplopoda		

Orders SPIROBOLIDA and SPIROSTREPTIDA		
	Various Giant Millipedes	2
Class Insecta		
Order PHASMIDA		
Family Pseudophasmatidae		
genera *Agathemera* and *Anisomorpha*		2
Order HEMIPTERA		
Family Reduviidae	Assassin Bugs	2
Class Crustacea		
Sub-class Malacostraca		
Order STOMATOPODA	Mantis Shrimps	2
Order DECAPODA		
Family Nephropidae	(large specimens) Lobsters	2
Family Coenobitiae	Robber Crabs	2

ECHINODERMATA

Class Echinoidea	Long-spined Sea Urchins	2

Ends