Caring for Wildlife - The World Zoo and Aquarium Animal Welfare Strategy
Chapter 2: Monitoring and Management of Animal Welfare

Our commitment is to monitor the welfare state of animals to achieve high standards of care

RECOMMENDATIONS

To realise our commitment to high animal welfare standards, the *World Zoo and Aquarium Animal Welfare Strategy* calls on member organisations to:

1. Make animal welfare-based accreditation a priority. This may be through your regional zoo and aquarium association or by adopting welfare standards and monitoring used by other regions or countries.
2. Make sure that animal care staff have relevant scientific training and expertise, keep abreast of latest developments in animal health and welfare monitoring methods, and link with other professional bodies and organisations to share knowledge and best practice.
3. Develop and maintain a staff culture that practices regular reporting and monitoring of animals' behaviour and health. Maintain and keep updated all associated animal records.
4. Using up-to-date animal welfare research, collaborate with other institutions to establish 'baseline' animal welfare data for individual animals and groups to enable comparison with any new data.
5. Scrutinise how animals are transported and address any potential animal welfare risks. Develop plans for moving animals that also abide by any relevant national and international standards. Require that animal welfare standards and practices of receiving institutions are checked and seen to be at or above those outlined in this Strategy and regional zoo and aquarium associations' welfare policies.
6. Employ veterinarians, biologists, welfare scientists and behavioural experts with experience in a broad range of taxa to ensure high standards of animal welfare and health care, including preventative health care interventions.
7. With regard to whole-of-life care, develop comprehensive animal health plans and, if needed, specialist policies that include catering to the special needs of very young, ill, injured and geriatric animals.
8. Put plans in place to prevent and address animal disease outbreaks, including disease transmission between animals and people, and ensure that quarantine protocols are available when required.

INTRODUCTION

Monitoring animal welfare is clearly critical to effective animal management in zoos and aquariums. The physical/functional indices and behavioural indices referred to in Chapter 1 may be used to detect poor animal welfare and identify features of positive experiences. They also enable the detection of improvements in poor welfare by applying remedial husbandry and veterinary therapeutic interventions, and/or by providing animals with welfare-enhancing behavioural opportunities. Managing the high numbers of species in zoos and aquariums also requires high levels of staff expertise and sound planning and policies.

SPECIES-AND ANIMAL-SPECIFIC KNOWLEDGE

As outlined in *Chapter 1*, the number of species held by zoos and aquariums creates significant challenges in animal welfare monitoring. Developing strong staff expertise and working with others to develop species-specific knowledge are vital to enhance animal welfare monitoring. Additionally, specific staff knowledge and development of staff expertise to better understand behavioural traits and changes in individual animals must be an ongoing priority.

Progress is being made to address these challenges through regional zoo and aquarium associations' accreditation programmes. For example, commencing in 2014, the Zoo and Aquarium Association (ZAA) Australasia's programme assessed welfare compromise and welfare enhancement in member zoos and aquariums across a range of species. This approach can lead staff to improve current management of the physical/functional aspects of welfare and to identify novel ways of enhancing welfare by the provision of previously unrecognised opportunities for animals to engage in behaviours they are likely to find rewarding. Wherever possible, zoos and aquariums should seek accreditation through regional zoo and aquarium associations, as many of these associations are leading in assessment and management of appropriate species-specific care of wildlife.

Keeping records that detail the physical, functional and behavioural observations are important for effective animal welfare management. Records enable the ongoing condition of animals, including any changes, deterioration, stability or improvement in welfare states, to be noted. They also enable any unintended management changes that may be identified as responsible for a problem and the outcomes of any purposeful husbandry or veterinary interventions to be noted. Such information not only provides a basis for review of the impact of current

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Disneys Animal Kingdom, FL USA, Tigers

Case study 2.1:
Systematic behavioural monitoring is a tool that can be used to optimise animal welfare.

The team at Disney's Animal Kingdom had a long-term behavioural monitoring programme in place to assist in their management of six female tigers (*Panthera tigris*). These tigers were socially housed, which was a unique management situation in zoos. The monitoring programme allowed the team to track changes in the social relationships of these animals over time. These observations informed selection of the various social groupings to maximise compatibility, while maintaining variability in social partners. The study also allowed for the staff to determine the impacts of different management practices, exhibitry techniques and impact of exhibit construction on the behaviour of individual animals. The behavioural monitoring programme thus informed animal care decisions with optimal welfare outcomes, while also providing important baseline information to others zoos considering social housing of tigers.

San Diego Zoo, CA, USA, Brown bear

Case study 2.2:
The value of regularly collecting animal welfare data.

In many zoos and aquariums, staff members assess daily activity patterns of animals, but the value of doing this may be reduced when only limited time is spent with animals in avery specific context. For most zoo and aquarium animals, the appearance of staff members can indicate an opportunity to receive food. Because of this connection, it is logical to assume that the absence of the staff members indicates no such opportunity. As such, food-related behaviour (e.g. exploration or foraging) seldom occurs when staff members are not present. Daily monitoring of an older brown bear (*Ursus arctos*) at San Diego Zoo indicated low levels of foraging behaviours until the introduction of an automatic feeder that was set to distribute random amounts of dry food at random intervals. After its installation, the brown bear's foraging behaviours increased five-fold and inactivity and stereotypic pacing decreased. The detailed monitoring allowed staff members to see the complexity of foraging behaviours and motivated a husbandry change, coupled with a philosophical change in the approach to providing food.

practice (*see case study 2.1*), but can also guide the introduction of novel approaches intended to enhance welfare (*see case study 2.2*).

WHOLE-OF-LIFE CARE OF ANIMALS

Many animals in zoos and aquariums spend their whole lives in a managed environment and may be present as a newborn, young, adolescent, mature and aging individual. Clearly, welfare-focused monitoring and management procedures need to be tailored to manage the changes required to care for the relative levels of robustness or vulnerability of animals during the different stages of their lives. Although the quality of care provided should be similar throughout the animals' lives, the character of care will be adjusted (*see case study 2.3*). This approach requires specialist knowledge

Case study 2.3:
Decision to hand-raise a young animal

A Javan gibbon (*Hylobates moloch*) born at Perth Zoo was dropped by its mother and was struggling to survive. The Zoo's animal specialists made the considered decision to hand-raise the animal. The intention was to reintroduce it to its family group as a priority, using proven methods applied to another gibbon species. Gibbons are highly social species and it is Perth Zoo's policy that due to animal welfare and long-term behavioural needs, gibbons should only be kept in family groups. The decision to hand-raise this animal was made under the framework of a clear policy and up-to-date knowledge on the management and welfare of social species such as gibbons. In addition, there was oversight by an animal ethics committee with external membership and Zoo staff members. Perth Zoo has a strong history in gibbon management and of integrating hand-reared offspring back into gibbon families. It has successfully reintegrated white-cheeked gibbons (*Nomascus leucogenys*) back into family groups and they have subsequently successfully bred whilst living in a social group as part of the Australasian regional breeding programme.

Perth Zoo, Australia, Javan gibbon

and skills, which if not available within an institution, should be sought through working with others.

Lifespan can vary between species from short to very long. The lives of longlived animals can extend many years beyond their capacity to reproduce. Organisational planning for the long term must ensure that welfare is monitored and managed appropriately throughout the lives of all animals, and should include specific strategies for the care of geriatric animals. Making the environment more comfortable, dietary adjustments and testing for age-related diseases or other infirmities are some examples. Decision trees that take into account these factors and others, such as the natural longevity for the species and the level and frequency of veterinary intervention, can also be necessary. An aged animal's welfare state, if compromised, should be regularly assessed to determine if euthanasia would be preferable to ongoing veterinary care.

When animals are moved, zoos and aquariums should develop plans supported by professional staff so that animal acquisitions, movements and transactions do not result in poor animal welfare outcomes. Regional zoo and aquarium associations may have guidelines that can be applied to individual transactions.

VETERINARY CARE

Professional veterinary input is an essential part of providing appropriate health care and monitoring of the ongoing condition of zoo and aquarium animals. Registered veterinarians should always be a part of an animal management team, either through direct employment or by contracting private or consultant veterinarians. The number of veterinarians required will depend on the size and complexity of the zoo or aquarium.

Direct employment of veterinarians in zoos and aquariums provides a greater insight into the daily functioning of the organisation and provides more opportunities to holistically manage the diversity of the species held. Veterinarians specifically skilled in exotic animal and species-specific medicine should be sought locally and also from specialist veterinarians within the worldwide zoo and aquarium veterinarian community.

The implementation of some veterinary treatments may temporarily compromise animal welfare. Examples include pre- and post-treatment handling, surgical procedures and quarantines. Clearly, a major objective is to minimise any compromise and to expeditiously restore the animals' capacity to experience positive welfare states. All facilities in which animals undergo procedures, treatment or observations should be purpose-designed or retrofitted to facilitate veterinary interventions and the realisation of welfare aims (*see Chapter 4*). Also, facilities design should address staff safety when handling potentially dangerous animals.

Most zoo and aquarium animals are non-domesticated wildlife species and usually resist restraint and treatment. Positive reinforcement training has become a popular and necessary practice that is used well by zoos and aquariums to reduce stress on animals and which can minimise the requirement to use anaesthetics or sedatives. Training an animal correctly can reinforce a positive relationship between the trainer and animal, and encourage positive welfare for future interactions. All training should create an environment that is interesting and stimulating for the animals and allow animal choices to participate.

Positive reinforcement training focuses on a type of learning in which the animal is rewarded for desirable behaviours, and hence reinforces them. Such

uShaka Sea World Durban, South Africa, South African fur seal

Case study 2.4:
Positive reinforcement training for veterinary procedures.

Gimli is a South African fur seal (*Arctocephalus pusillus*) born at uShaka Sea World Durban in 1986. The animal is blind and, although in retirement, still undergoes daily routine and new husbandry training. The animal presented with lethargic behaviour, swollen flippers and a racing heart rate. Many voluntary diagnostic procedures were performed on it, including x-ray, ultrasound and a needle biopsy. The animal cooperated exceptionally well. A mass near the bladder was found as well as some heart abnormalities. All seals at uShaka Sea World are trained to participate voluntarily in routine procedures, such as ear, eye and mouth examination, body condition scoring, taking temperatures, tooth brushing, auscultation, weighing, blood sampling, ultrasound and x-ray. A strong history of positive reinforcement training and animal– trainer relationship was paramount in the care of this geriatric seal. The animal was trusting and patiently allowed these procedures, even though it was not food motivated. The alternative of manual or drug restraint would have been stressful and potentially detrimental to the animal's health.

training, where animals present voluntarily for various procedures, can therefore assist veterinarians to use procedures that are largely non-invasive in health monitoring. These include administering injections, drawing blood, providing foot care and many others (*see case study 2.4*). Training of animals in this area and to enter their transport containers should be the norm at modern zoos and aquariums. An aversive training technique that includes inflicting pain and stress should not be applied within training practices.

Meticulous preparation for any anaesthetic event is critical to minimise any associated welfare compromise and to ensure that the aim of the procedure is achieved. Thus, an anaesthetic procedure plan should be drawn up in advance for every such event and it should be discussed and understood by all of those involved. When necessary, colleagues and the literature should be consulted for guidance about the choice of anaesthetic and its use. A post-anaesthetic debriefing should also be held to identify improvements for future application.

Veterinary responsibility extends to the management of animals quarantined to maintain biosecurity. Significant animal welfare compromise may occur in quarantined animals should they be stressed due to transport, relocation into unfamiliar surroundings, separation from familiar conspecifics and/or isolation, and in some cases being subjected to veterinary procedures. It is important for animal care staff working in quarantine areas to have the knowledge and skills required to detect abnormal behaviours and signs of illness and stress. The welfare focus of quarantine design should minimise the risk of injury and allow inclusion of enrichments and places for retreat to reduce stress. Animals should not be quarantined for longer than the minimum period needed to meet biosecurity requirements.

Zoonosis, the transmission of diseases between species, is of significant concern in zoos and aquariums because of the close proximity of animals to each other and of animals to humans. Safeguarding animal populations against cross-infection within establishments is a primary responsibility of the veterinary staff, who also have a major role in minimising disease transmission from animals to people.

Post-mortem examination of animals that die should always be conducted to better understand animal health and welfare. When planning human–animal contact, detailed management protocols should be in place to prevent zoonosis. Moreover, the veterinarian should ensure that a comprehensive animal health programme is in place and that only healthy, behaviourally suited and uncompromised animals are considered for direct human contact.

COLLABORATION IMPROVES MONITORING METHODS

Improvements in animal welfare benefit all zoos and aquariums and are often grounded in scientific study. These two factors lend themselves to collaborative efforts of peers and the development of professional groups that focus on industry-level approaches to the support of animal welfare initiatives (*also see Chapter 8*).

In the USA, several zoos and aquariums have developed centres that serve to perform animal welfare research and disseminate findings (*see case study 1.1*). These organisations are additionally supported by the Association of Zoos and Aquariums (AZA) animal welfare committee that works to identify general needs and support progress across North American zoos and aquariums. The European Association of Zoos and Aquaria (EAZA) secured funding to employ an animal welfare training officer and has also developed an animal welfare working group, both of which are intended to support initiatives of all EAZA members aimed at reaching high standards of animal welfare.

Recent and future symposia held at the Chicago Zoological Society's Center for the Science of Animal Welfare, Detroit Zoological Society's Center for Zoo Animal Welfare and other zoological institutions support the development of collaborative partnerships and the dissemination of ideas and findings among colleagues internationally.

CONCLUSION

Animal welfare monitoring or assessment is a critical component of modern animal care in zoos and aquariums. Monitoring programmes can take several forms but should employ indices based on physical/functional conditions and behaviours that are aligned with negative and/or positive experiences animals may have.

Traditionally, preventing or minimising negative animal welfare states has been the predominant welfare focus of animal management, but the promotion of positive welfare states is now receiving increasing attention. Monitoring using welfare-focused indices and record keeping are important components of effective animal welfare management systems, which must also be able to deal effectively with animals during all the stages of life represented within the organisation. Additionally, the adoption of animal management methods such as positive reinforcement training and the ongoing delivery of veterinary expertise enable this to occur.

Zoo and aquarium staff members should keep abreast of developments in animal health and welfare monitoring. Numerous resources exist that facilitate collaboration in investigating new questions in animal welfare. Resources should be aimed at training all relevant staff members to assess and monitor animal welfare and to support monitoring programmes.

Shedd Aquarium, IL, USA, An aquarium staff member provides care for a penguin chick.