Caring for Wildlife - The World Zoo and Aquarium Animal Welfare Strategy
Chapter 5: Breeding Programmes and Collection Planning

Our commitment is to breeding programmes that achieve conservation outcomes, sustainable species management and promote positive animal welfare states.

RECOMMENDATIONS

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

1. Introduce and follow breeding plans and species management recommendations that align with overall species conservation plans and seek to minimise negative welfare consequences for animals.
2. Facilitate positive welfare management during breeding events through using, for example, oestrus monitoring, animal separations and ongoing skilled observation.
3. Use professional staff, by external specialist input if necessary, to oversee breeding-related animal welfare issues.
4. When breeding animals for release, give specific attention to balancing animal welfare with survival in the wild and replenishment of wild populations.
5. Develop and use a clear euthanasia policy, which outlines the circumstances for the use of euthanasia and those who are mandated to perform it.
6. Ensure that species-specific animal welfare considerations are fully integrated into long-term collection planning that guarantees animals can be provided with whole-of-life care and a high level of welfare throughout their lives.
7. Ensure that in considering inward animal transactions, all animals come from sources that do not impact on wild populations or reinforce commercial production of wild animals where animal welfare may be compromised.

INTRODUCTION

Breeding can involve positive, enriching forms of natural behaviour for wildlife species in zoos and aquariums; however, it can also raise complex ethical and welfare issues. An overarching principle in considering any breeding event in zoos or aquariums should be the balance between animal welfare and the needs and tools for population management, informed by expertise in species-specific natural behaviours.

With the predominant objective of modern zoos and aquariums as wildlife conservation, interpretation of how we might achieve this through breeding programmes varies. However, there are common themes emerging that include species-specific expertise and knowledge underpinned by a strong cooperative planning approach.

ANIMAL COLLECTION MANAGEMENT AND BREEDING

Breeding programmes in modern zoos and aquariums should be managed through species management programmes involving good planning in cooperation with specialist zoo and aquarium organisations, such as regional zoo and aquarium associations. Collaborative species management should underpin all decisions about animal breeding and animal collection planning.

Animal collection planning should be core to all zoos and aquariums (*see case study 5.1*). With regard to animal welfare, such planning should include consideration of the ability to provide positive welfare states for certain species or particular animals as being fundamental to whether or not they should be held.

In many areas around the world, it is the role of the regional zoo and aquarium associations to coordinate and assist with managing animal populations, by supporting collection planning, ensuring good species management practices, and overseeing and advising on how to promote positive animal welfare states within that framework. This is also a growing area of global coordination via Global Species Management Plans (GSMPs) through the WAZA Committee for Population Management (CPM). Zoos and aquariums should continue to use these programmes and, where possible, collaborate to further build regional and global breeding programmes.

High-quality record keeping is pivotal to successful species management, as the underlying principle of management is to cater for the relatedness of individuals in the population and the species-specific outcomes from an animal welfare perspective. The International Species Information System (ISIS), incorporating its Zoological Information Management System (ZIMS), is one such system that is vital for global management of sustainable populations. This system enables the dissemination of information that will help to build knowledge of successful animal breeding.

'NATURAL' BREEDING IN A ZOO OR AQUARIUM

In recent times, concerted efforts have been made in zoos and aquariums to allow individual animals to breed in situations that closely mimic natural processes. This is based on a need to ensure breeding success and may have some beneficial welfare outcomes. Overlying this is a complex system of species management that aims to maintain sufficient genetic and demographic diversity to

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Case study 5.1:
What is an animal collection plan?

An animal collection plan outlines the species and numbers of animals held, planned breeding, animal movements in or out of a zoo or aquarium, and future directions. Leading zoos and aquariums align animal collection planning decisions with collection planning principles and related policies endorsed by the responsible institution's governing authority. A collection plan takes into consideration the facilities available, exhibits and spaces on public view and behind the scenes, species requirements for both welfare and management, and the need to maintain a collection that aligns with the zoo's or aquarium's purpose and mandate. Zoos and aquariums should develop collection plans to support the delivery of conservation objectives, either through direct conservation outcomes or through visitor/public engagement outcomes.

- Perth Zoo, Australia, Bilby joeys

promote sustainability of zoo and aquarium animal populations and support wildlife conservation.

Breeding programmes in zoos and aquariums strive for as much genetic diversity over generations as possible. Ensuring genetic diversity is important for animal welfare as it contributes to animal health in individual animals and also inter-generationally. Well-managed breeding programmes must consider animal welfare, with zoos and aquariums making every effort to balance the ethical and welfare issues with the need to sustainably manage populations. The assistance of animal ethics and welfare committees, or other such entities, can help to address the complexities of decision-making in these areas.

Zoos and aquariums can beneficially work collaboratively with other partners to access or further develop technologies that integrate the minimisation of animal welfare compromise and the maintenance of positive welfare states with sustainable species management. For example, some breeding programmes employ hormone testing, assisted reproductive techniques, stress monitoring and application of the latest species-specific knowledge. These approaches may be overlaid with non-invasive animal management techniques using positive reinforcement to minimise harm and stress.

The conduct of breeding programmes should be part of broader long-term species management planning that considers whole-of-life care and high levels of animal welfare. Many zoos and aquariums actively manage reproduction to avoid unwanted breeding events. Others may use euthanasia, should this be legal and culturally appropriate in their country or region.

The effective use of contraception is one of many aspects of managing a modern zoo or aquarium and as such the expertise and knowledge of veterinary staff members is vital to successful reproductive management. Managed reproduction is also essential to support conservation programmes to ensure the best genetic and demographic outcome for future breeding.

MANAGING AGGRESSION AND HARM

Another core expertise of modern zoos and aquariums impacting on animal welfare is the management of natural behaviours within the contained area of an exhibit. For many species, breeding can result in high levels of aggression between animals, and injury (*see case study 5.2*). This may be a common wild behaviour for the species. Zoos and aquariums work hard when managing such scenarios to minimise possible harm, as poor management in this area can result in serious animal injuries and deaths.

Should aggression occur, exhibit design should complement and accommodate safe animal breeding. Zoo and aquarium staff should have detailed knowledge and expertise regarding managing animal introductions, in order to minimise animal injury and achieve the best breeding outcome. Additionally, the use of science that assists zoo and aquarium professionals to determine the appropriate time for breeding introductions is essential.

Case study 5.2:
Managing aggression when breeding herd species

Ideally, breeding should occur within the herd for good animal welfare and cohesive group dynamics. Zoos and aquariums should be mindful of herd genetic and demographic integrity in considering breeding, in conjunction with the broader management of the species involved. The nature of herd species, particularly with males, is that there will be times during the year where antagonistic behaviour may arise. Natural breeding behaviours, whether aggressive or not, may be vital to ensure successful breeding. However, if antagonistic behaviour in breeding situations is ongoing, particularly outside the normal breeding season, this could become an animal welfare issue for the subordinate individual and should then be addressed. Again, zoo and aquarium staff members should have good knowledge and expertise of direct relevance to the species, the individual animals and the likely group dynamics. This will assist decision-making about separating individuals or allowing aggressive behaviour to take its course.

- White Oak Conservation Center, FL, USA, Somali wild ass

BREEDING FOR RELEASE

The long-term sustainability of display animal populations and the provision of animals for conservation breeding are not mutually exclusive. In many cases, animals used for conservation breeding purposes are also on display to the public, while in other scenarios, individuals involved in such breeding programmes will be held off-display. Whether or not to display these breeding animals is dependent on the particular programme and the species.

Many breed-for-release programmes undertake pre-release conditioning that may lead to a transient reduction in animal welfare. Pre-conditioning may involve, for example, manipulating an individual's diet to mimic more closely the diet in the wild, such as limiting food resources (e.g. gorge-and-starve diet); introducing live prey items (which can raise concerns for the welfare of the prey animal); or introducing predator conditioning that instigates a flight response. Prior to committing to a breed-for-release programme, zoos and aquariums should assess if the long-term survival risks to the individual animal, and the ongoing survival of its species, outweigh the transient compromises to animal welfare during the pre-release conditioning stage. Input of others through an animal ethics and welfare committee can significantly assist in assessment and support of such a situation, in addition to the input of conservation authorities.

TRANSACTIONS FROM THE WILD, RESCUES AND FARMING

All transactions from the wild should comply with global principles as endorsed through international conservation bodies, such as the International Union for Conservation of Nature (IUCN). It is central to the modern zoo or aquarium that the intention of removing an individual from the wild must have a clear and proven conservation purpose, or, when working with responsible authorities, the purpose targeted should be education, research or collecting individuals for programmes that aim to promote the long-term sustainability of wild populations (e.g. breed-for-release initiatives). Effective zoo and aquarium animal collection planning, species management and cooperative breeding plans are essential tools in this regard.

The commercial production of wild animals ('wildlife farming') can stimulate unsustainable and illegal sourcing of individuals from the wild, which can undermine the conservation remit of modern zoos and aquariums. The scale and intensity of such commercial production methods can also have a negative impact on wild animal welfare. Zoos and aquariums should avoid sourcing animals from commercial breeding facilities. Consistent with WAZA's 2014 resolution on this matter, zoos and aquariums, when considering inward animal transactions, should ensure that all animals come from reputable sources, do not impact on wild populations or reinforce commercial production of wild animals, and avoid the negative welfare consequences of indiscriminate capture.

Many zoos and aquariums increasingly take on 'rescue animals' as a result of seizures from illegal wildlife traders or from organisations that close or cannot care for animals adequately. This is often at the request of governments. In some jurisdictions, sanctuaries may exist to care for such animals; however, given their animal care expertise, modern

Case study 5.3:
The Free the Bears Fund in Australasia

The Free the Bears Fund is an organisation that works across southeast Asia to rescue sun bears (*Helarctos malayanus*) and Asiatic black bears (or moon bears; *Ursus thibetanus*) from bile farms, the restaurant trade and the pet trade. Over the past 10 years, several Australian and New Zealand zoos have supported Free the Bears with funding for assistance to their sanctuaries, community education programmes and conservation research on the status of wild bears in Laos and Cambodia. Zoos have also taken rescued sun bears into their animal collections to support the Australasian regional breeding programme for sun bears, as well as to advocate for Free the Bears and sun bear conservation and to oppose the illegal trade in wildlife.

- Perth Zoo, Australia, Sun bear

zoos and aquariums are often well placed to provide long-term care for these animals.

Caring for rescue animals provides clear opportunities for public education on key themes in animal welfare and conservation, such as the growing global illegal wildlife trade (*see case study 5.3*). In providing homes for rescue animals, zoos and aquariums can make a real difference to individual animals as well as boost the sustainability of regional and global zoo and aquarium animal populations. Considering the availability of space and resources for rescued/confiscated animals and their whole-of-life care may be an important component of animal collection planning.

USE OF EUTHANASIA

Euthanasia is the act of providing a humane death. Animals should be treated with respect throughout their lives and, when necessary, given a humane death. All zoos and aquariums should have clear policies to deal with the euthanasia of animals. Euthanasia policies should clearly outline the circumstances of how and why euthanasia will be used. Euthanasia should be overseen and approved by an experienced veterinarian or senior animal management staff member briefed by a veterinarian. Decisions on euthanasia should be based on context-dependent evaluation of all alternatives. Some institutions find it beneficial to involve an animal ethics and welfare committee, or other such entity that has external members, in such evaluations (*see case study 5.4*).

The death of an animal in a zoo or aquarium can evoke public interest as well as emotion from staff members, volunteers and the visiting public. This may particularly be the case when the animal has been euthanised. In some circumstances, zoo and aquarium visitors, staff members and volunteers may need an explanation of the rationale

Case study 5.4:
What is an animal ethics and welfare committee and how can it work for your organisation?

Many zoos and aquariums use an animal ethics and welfare committee to assist in the management of animals in their organisation. In some jurisdictions, this is required by law. Animal ethics and welfare committees can have external members to broaden your organisation's community connection and access external animal welfare and animal ethics expertise. Such committees can be valuable to gauge your community's responses to animal management issues; inspect facilities; can consider new policies and procedures in animal welfare; or can assist with complex ethical issues that may arise in animal care. Such committees can also promote greater understanding of the complexities of zoo and aquarium animal management among staff and other participants. The process can also increase accountability and transparency for decision-making in animal care.

- Houston Zoo, TX, USA, Pygmy marmosets

- El Valle Amphibian Conservation Center, Panama, Rusty robber frog

of the euthanasia decision and it may be beneficial and necessary to take time to explain the reasons.

USE OF ADVANCED BIOTECHNOLOGIES

Modern zoos and aquariums are using more technological advances to assist with breeding programmes, from using molecular genetics to identify valuable individuals in the breeding of threatened species to applying assisted reproductive technologies, including artificial insemination, embryo transplantation, intracytoplasmic sperm injection and *in vitro* fertilisation.

When undertaking assisted reproduction in zoo and aquarium animals, consideration should be given to the welfare of the individual animals involved. The risks, benefits and animal welfare outcomes should be fully explored when planning such events. Potential barriers to natural reproduction should also be considered.

CONCLUSION

Animal welfare and the balance between welfare compromise and positive welfare states should be integrated into the recommendations and decisions of breeding programmes and into zoo and aquarium collection planning.

High-quality zoo and aquarium collection planning must be based on a commitment to wildlife conservation and species management. This ensures that both the genetic and demographic integrity of zoo and aquarium populations and wild populations are maintained. It also provides opportunities for zoos and aquariums to educate the public about conservation and welfare. Zoo and aquarium staff members undertaking species management should be fully aware of regional and global priorities in relation to the species in their care, understand the benefits and limitations of current management methods and ensure high-quality record keeping.