World Association of Zoos and Aquariums
GLOBAL SPECIES MANAGEMENT PROGRAMS

Why coordinate globally?

Zoos now play a significant role in saving threatened species. They encourage public interest and awareness of the threats to biodiversity at home and in remote corners of the world. Zoos are experts in breeding animals and in providing space for threatened species until safe, wild habitats are again available.

If managed properly, *ex situ* populations can also serve as important genetic and demographic reservoirs to help wild populations survive and recover in the future. To do so, we need to manage *ex situ* populations to ensure their genetic health and integrity and to retain their long-term viability.

Without management, *ex situ* populations will not be useful for conservation

If not managed properly, *ex situ* populations will become genetically impoverished and as a result animals within the population will likely breed less well, have offspring that survive less well, and be less adaptable in the face of changing environments and new diseases. These effects are well documented in a wide range of species.

Small populations are particularly sensitive to these effects and therefore are particularly vulnerable to extinction.

Zoo populations are too small to survive without close management

Ex situ populations are always small in comparison to healthy wild populations.

Global holdings of priority species rarely exceed 350 specimens (average population size 301 across 174 global studbooks: ISIS/WAZA Studbook Library CD-ROM, 2006). In comparison, wild populations of less than 1,000 adults are considered vulnerable to extinction solely because of their small population. Indeed, wild populations of less than 10,000 adults may still be considered vulnerable to extinction if they are showing some decline.
Further exacerbating this, *ex situ* populations are largely managed at a regional, rather than global level, and regional *ex situ* populations are much smaller again.
Extending the life of captive populations and preserving their genetic and demographic value, requires careful management of animal movements, breeding and husbandry. This is most effective when planned strategically and coordinated centrally. Mechanisms for strategic planning and central coordination of population management are now well established in several zoo regions, and are progressing in others.

Linking regional populations gives larger populations to manage

For some populations, management at regional level may be sufficient to achieve program goals. For many, however, population size, carrying capacity or genetic limitations may prevent those goals from being achieved. In such instances, linking regional populations into a multi-regional or global program increases the size of the population being managed, and may be an effective way of ensuring its persistence and preserving its conservation potential.
Global management can offer advantages to different types of population. For example:

• For **small, widely dispersed** populations, global management provides an opportunity to link up a number of isolated, unsustainable units, improving demographic stability and managing inbreeding and gene diversity more effectively.
• Recent research demonstrates that the genetic diversity of **large global population**s may benefit from strategic population sub-division and restricted but carefully managed migration between these sub-populations.

• For **expanding populations** that are primarily held in one region but sought after in others, global management may be a useful mechanism for distributing important founder lines so that overall genetic diversity is maximised. In the absence of such management, over-represented lines are often continually exported from the source region to found new populations. This can reduce the genetic potential and therefore the conservation value of those populations.

What is a global program?

A WAZA Global Species Management Program is one that involves collaboration between two or more regions and has been endorsed by WAZA as representing a global priority for zoos and aquariums.

Such programs are overseen by the WAZA's Committee for Inter-regional Conservation Cooperation (CIRCC).
Where management of an *ex situ* population is of global priority, WAZA Global Species Management Program are established to:

• encourage effective collaboration at a multi-regional level
• ensure appropriate consultation with relevant bodies in range states
• regularly generate and distribute recommendations for the management of the taxon in zoos and aquariums
• maximise zoo and aquarium contributions to the conservation of those species and their habitats

The program is overseen by a GSMP Management Team that has been authorised by CIRCC. The program management team is made up of all regionally appointed *ex situ* population managers of WAZA member associations (all relevant regional species coordinators and/or studbook keepers) as well as the International Studbook Keeper if one exists. A global program coordinator is elected by the management committee from amongst its members.

What do global programs need?

International Studbooks
For global programs to work, they need to be based on accurate, current information about specimens in the population and their location. Maintaining this information is the role of the International Studbook Keeper. International Studbook Keepers operate under WAZA and information on applying for, maintaining and reporting on, international studbooks, is available from the WAZA Secretariat.

Population Management
To realize genetic and demographic potential, global programs must operate to a long-term strategic plan. This plan needs to describe the goals of the captive program, and how genetic and demographic management is to be organized to meet those goals. The plan should include information about target population size, the genetic management strategy to be applied, and how production of surplus is to be managed.

An understanding of species biology
The plan for a global program should identify the biological constraints within which population management will operate.

For example, where reproductive pairings can be manipulated and monitored, genetically optimal breeding pairs can be identified and established as required.

However, for some highly social species, the need to maintain social cohesion will need to be factored into the demographic and genetic management strategy. This can be catered for in some instances by applying group management schemes such as the Maximal Avoidance of Inbreeding scheme described by Princee (1995).

For some pair-bonding species, the need for females to select mates in a group setting may need to be accommodated.

The global program Management Team will develop long-term genetic and demographic management strategies to accommodate the needs of the species.

Reliable husbandry practices
Population management is only really effective where animal husbandry practices for the target species are reliable and consistent. Of particular relevance is the ability to breed and to prevent breeding, to rear reproductively competent offspring and to transport without injury. The global coordinator plays a role in determining what husbandry issues need to addressed within the program, and in assisting institutions with the information and contacts that they need to develop and hone the necessary skills. Where it is possible to do so, the coordinator may assign program roles to institutions on the basis of available skills and experience. For example, priority breeding animals may be preferentially assigned to institutions with a good breeding record. Institutions new to the species may be asked, in the first instance, to take post-reproductive animals, single-sex groups or individuals from genetically over-represented lines.

Regional husbandry networks should be used to provide support wherever possible.

Records keeping
Maintaining good, accurate records of birth and death dates, parentage, and animal transfers, is crucial to program management.

Some populations or species may require additional information. For some species and for some styles of management, accurate records can be difficult to maintain. Though it is possible to design programs to deal with this (for example those based around group management, such as Maximal Avoidance of Inbreeding (MAI) schemes (Princee, 1995) all efforts should be made to improve records keeping in the first instance).The global coordinator, in consultation with participants, will determine a reasonable, minimum standard of records keeping for the target species, and for the management strategy selected. Where institutions are unable to keep data to the agreed standard they may be assigned a role in the program that takes account of this - that is, they may be asked to hold non-breeding, single-sex groups or post-reproductive animals - until systems for maintaining more accurate records are in place. All efforts should be made, however, to encourage standard record keeping throughout.

Use of technology
Some biological constraints can be overcome with technologies such as artificial insemination and embryo transplant. Such technologies, though they may be useful to the program, will not be readily available to all institutions and may be available to very few. The global coordinator will design the program in this context.

Maintaining Consensus
To achieve program success it is important that all participating institutions understand the goals of the program and their role in achieving those goals. Further, they must have an opportunity to participate in management decisions. Implementation of transfer and breeding recommendations, of program policies and of required husbandry practices, is much more likely to occur where there is stakeholder participation, and where stakeholders are required to endorse recommendations formally. Population management recommendations and policies relating to the program are circulated to all program participants for review, comment and endorsement, before they are activated.

Evaluating Success
The success of each global program is evaluated periodically by CIRCC. This evaluation will usually be conducted every five years. However, for some species, particularly those where significant change might be expected over a relatively short periods of time, such as species that breed relatively frequently and show rapid generation turnover, program evaluation may occur more frequently.

The program's Management Team circulate transfer and breeding recommendations at least annually, in a standard format. The same document provides a report on the program's progress towards its agreed goals, and on progress with the previous year's recommendations. Final versions of these reports are sent to WAZA's Committee for Inter-Regional Conservation Coordination for evaluation.

The report enables the Committee to assess how the program is progressing, and the extent to which zoos are supporting program recommendations. Concerns raised by the Committee are directed to the global program coordinator.

Securing institutional commitment
One of the greatest barriers to viability is population size. For a program to succeed it must be able to grow to and remain at, target size. Where regional mechanisms for securing space commitments from institutions are in place, these should be used for global programs. Where they are not, commitments should be sought through a standard WAZA agreement. Space commitments should be for a period of time, and re-confirmed periodically as part of the annual reporting process.

Technical support

In those regions where population management programs are well developed, ongoing technical support for regional species coordinators is usually provided through the regional zoo association. Global coordinators should also use this avenue for support where it is available.
Where it is not, the global coordinator should seek the assistance of regionally appointed program champions where they exist, or seek to establish mentoring relationships within the program's Management Team to assist with capacity building where needed.

The role of WAZA and CIRCC

CIRCC is WAZA's Committee for Inter-Regional Conservation Coordination. CIRCC reviews applications to establish global programs and makes recommendations to WAZA Council on which should be endorsed for development.

The Committee tracks progress with developing programs and monitors and evaluates performance of established one. Regular performance reviews are provided by CIRCC to WAZA Council.

Complaints about program operation may be forwarded in writing to the CIRCC and the Committee will investigate these. Where possible, conflict within a program should be resolved by the global coordinator through the program's Management Team. Where attempts have failed, issues may be brought to CIRCC for resolution.

Making an application

Standard application forms are available on request from the WAZA Secretariat (email: waza.secretariat@bluewin.ch). Applications may be made by any member of staff of a WAZA member institution but must carry the following endorsements:

- The applicant's host institution
- The regional associations from all participating regions
- All existing Species Coordinators in participating regions
- The International Studbook Keeper (where one has been appointed)

Completed application forms are submitted to the WAZA Secretariat, which will organize a CIRCC review against the relevant criteria. Applicants are notified as soon as a decision has been made. All correspondence relating to applications should be addressed to:

WAZA Executive Director
Post address: P.O.Box 23, CH-3097 Liebefeld-Berne, Switzerland
Phone: ++41-31-300 20 30; Fax: ++ 41-31-300 20 31
Email: waza.director@bluewin.ch

Cautionary Note

Global management can be difficult and labour-intensive for the studbook keepers, coordinators and in some cases the institutions involved. It requires close communication and cooperation across a number of distant countries with different disease and regulatory environments. Movements across these international borders can be problematic and, where disease or pest issues prevail, movement may become impossible for periods of time.

Therefore, global management is not a quick or an easy solution to inadequate space commitments by zoos in participating regions. Where a region's population is small and remote, perhaps being held only by a few zoos or even by a single zoo in a region, it will be difficult to integrate such a sub-population effectively into a broader global program. It is likely that more animals will be needed to be moved international to support the regional sub-population.

For threatened species in particular, where captive stocks represent a conservation resource, the value of such small regional holdings should be carefully considered. Options such as expanding the local population or consolidating the *ex situ* population in institutions elsewhere might need to be considered.

Global management should be reserved for those taxa for which the conservation outcomes of global management are clear and significant.

Further, Global Species Management Programs will rely on a high level of cooperation between regions, and between institutions within regions. In order for global programs to be effective, the management plan must have the status of a formal agreement between regions, an agreement that is considered by the participants as a clear, mutual declaration of commitment after the manner of a Memorandum of Understanding. Such a commitment should leave some recourse for the program to retrieve for use in the program any genetically important stock should there be a need.

Erratum: Peafowl Feather Trade – A preliminary observation in Delhi

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The author Subhendu Mazumdar's contact details were missed in the original publication of Zoos' Print Vol: XXI, No: 12, p. 8. The details of the author are:

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