

Definition and evaluation of conservation breeding of captive tigers

As outlined in the IUCN SSC Guidelines on the Use of Ex Situ Management for Species Conservation, ex situ conservation has the potential to address the causes of the primary threats, offset the effect of the threats, buy time, or restore wild populations. Ex situ management for conservation (or conservation breeding) only applies to those *ex situ* populations that have conservation as their primary aim. The ex situ activities must benefit a population, the species, or the ecosystem it occupies, and the primary benefit should be at a higher level of organisation than the individual.

In this context, conservation breeding of captive tigers can be defined as: ex situ management of a population of tigers that typically aims to minimize the degradation of behaviors, physical attributes and genetic diversity of the species (or subspecies) over at least 100 years, and which aims to benefit the conservation of in-situ populations. A prime example is preparing for the conservation translocation of carefully selected and suitable individuals from this population into the wild where they are extinct, at an unviable density, or require genetic rescue, and where wild to wild translocations are not preferred or viable options. In addition to providing individuals for reintroduction or other conservation translocations, for genetic rescue or as insurance against extinction, conservation breeding may also include tailored conservation education, conservation research and training that targets the reduction of threats or the accrual of conservation benefits for the species. Breeding is managed and coordinated for all individuals in the ex situ population and typically organised regionally (i.e. at the scale of more than one country, not an administrative region or province within a single country) or globally, not at the facility level, through recognized associations.

Breeding is based on relatedness (typically referred to as kinship in professional population management programmes) and aimed at minimizing the inevitable loss of genetic diversity or maximizing individual heterozygosity dependent upon the restoration requirements.

Ex situ is defined as per the IUCN [Guidelines on the Use of Ex Situ Management for Species Conservation](#) as conditions under which individuals are spatially restricted with respect to their natural spatial patterns or those of their progeny, are removed from many of their natural ecological processes, and are managed on some level by humans.

To determine if existing facilities are engaged in conservation breeding of tigers the following checklist in the following table can be used (adapted from Appendix 2 in Launay et al, 2013) [Preliminary Study of the Feasibility of a Tiger Restoration Programme in Cambodia's Eastern Plains \(Appendix II\)](#).

Tigers in conservation breeding programs	
Desired product	Gene pool – long term maintenance of maximum possible wild gene diversity Note: a population with high allelic diversity and without adaptation to captive conditions would be preferable as it would contain more capability to adapt to wild conditions.
Aim	Maintain a behaviorally, physically and genetically healthy population over at least 100 years.
Coordination of breeding	Regionally (more than one country, not a region within a single country) or globally managed by zoo associations typically involving a number of cooperating zoos. Breeding recommendations based on genetic analysis, issued centrally and followed, after discussion, by all holders. Breeding outside recommendations actively avoided.
Genetic management strategy	Equalize and maximize the founder base. Avoid inbreeding.
Effect on wild gene pool	Maintained. Maximum possible wild gene diversity.
Approach to natural behaviors	Preserve natural behaviors. House only in facilities which preserve natural behaviors - avoid hand-rearing or unnatural social groups, for example, large single-sex adult groups as tigers are naturally territorial.
Demographic management strategy	Based on demographic analysis. Breed only as many animals as can be appropriately housed within the program for their lifetimes and as appropriate to the studbook requirements, i.e. conservation breeding is not about maximizing the number of the ex-situ population and there is no need to have high numbers. Lengthen afterbirth interval (breed slowly) to minimize genetic drift.
Founder stock and breeding pool	Stock clearly tracing back to known wild caught founder stock and geographic origin (labeled using sub-specific designations) and therefore contain discrete sets of genetic adaptations to a particular habitat and climate type. Each regional population is managed to conserve a gene pool as broadly representative of the original wild population as possible.
Record keeping	All tigers can be traced through institutional records, with ancestry fully known and recorded.

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