

Conservation breeding: objectives and contemporary challenges

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Conservation breeding or captive breeding program include efforts to manage the breeding of plant and animal species. The objective of this technique is to establish and reintroduce a self-sustainable population of a species that closely resembles its natural counterpart. It represents the last chance of survival for many species with imminent extinction risk in the wild. Since this program was started several endangered plants and animals have been rescued from extinction. In 1991, the Center for Plant Conservation established the guidelines to select candidate plants for conservation collections. For animal species, it is generally assumed that a maximum of 500 animal species could be maintained of site in captive breeding programs (IUDZG/CBSG 1993). In 2002, the World Conservation Union (IUCN) has defined *ex situ* conservation as “the conservation of components of biological diversity outside their natural habits”.

Several *ex situ* techniques are potentially valuable in the conservation of threatened species with extinction risk where the major goals to be solved are:

When should captive breeding be considered as a conservation option?

Generally captive breeding is recommended for many taxa, but it is clear that only few threatened wild species of plants and animal can be maintained *ex situ* because it is difficult, expensive and the resources are limited.

What criteria should be used to indicate which species should be destined to conservation breeding program?

Some researchers suggest that should be considered the economic success in captive breeding, biological convenience for captive breeding, the successful reintroduction to the wild and the effect on habit preservation.

What are the potential problems with a conservation breeding program?

Nowadays conservation breeding presents a serious practical challenge because of several conflicting processes, like inbreeding depression, random genetic drift, and genetic adaptation to captivity.

What is done to solve the problems in conservation breeding?

The most of captive breeding programs focus on reduce genetic drift and inbreeding depression, and maximize the genetic variation and number of surviving individuals. So increasing attention is given to the mate choice, its impact on genetic variability and adaptation to captivity. Recent reports bring the benefits in applying sexual selection theory to manage captive breeding and indicate sexual selection as a powerful force to purge deleterious mutations from the genome

“The major challenge of ex situ conservation will be to ensure that sexually propagated rare plants do not become museum specimen incapable of surviving under natural conditions” Spencer Barrett & Joshua Kohn (1989).