Agri Articles
(e-Magazine for Agricultural Articles)
Volume: 03, Issue: 06 (NOV-DEC, 2023)
Available online at http://www.agriarticles.com
©Agri Articles, ISSN: 2582-9882

Captive Breeding - A Tool for Conservation

(*Farheen Ansari)
Department of Animal Genetics and Breeding, College of Veterinary Science & Animal Husbandry, Nanaji Deshmukh Veterinary Science University, Jabalpur (MP)
*Corresponding Author's email: farheen218@gmail.com

Abstract
Captive breeding of endangered species is essential for their conservation. It also involves releasing them back into the wild in the future. Majority of captive breeding programmes focus on creating a self-sustaining captive population. Inbreeding and loss of genetic variation pose a significant threat to captive population. Zoos might be the last refuge for many animal species that are in danger of going extinct in the wild thus acknowledging their role in conservation efforts.

Keywords: captive breeding, zoo, conservation, endangered species

Introduction
An estimated one million animal and plant species face extinction due to human activity. According to estimates, the next few decades might see the disappearance of at least 20% of the world's biodiversity, mostly as a result of habitat fragmentation and changes. Thus, it is imperative that more people and organizations get involved in conservation efforts to protect our fragile ecosystem. In situ conservation protects the threatened species of plant or animal in their natural habitat. All species may not recover in the wild despite the best efforts of researchers and conservationists. Ex situ conservation strategies have proven essential to the survival of some critically endangered ones. One of the many methods conservation biologists have at their disposal to prevent the extinction of a species, subspecies or population is captive breeding.

Captive breeding
The practice of breeding wild animals in captivity, in facilities such as zoos or wildlife parks, is known as captive breeding. The main goal is to protect endangered species that face extinction in the wild. Additionally, when there is sufficient natural habitat to support new individuals or the threat to the species in the wild is reduced, individual species are released back into the wild as part of this process (Wakchaure and Ganguly, 2016). In addition to increasing the number of individuals of a threatened species, captive breeding programmes also strive to preserve a significant amount of the gene diversity found in the wild population. The goal of captive breeding programmes should be to generate and maintain healthy, self-sufficient populations of captive animals most similar to their wild counterparts both in terms of genetics and behaviour. In order to maintain the desired level of gene diversity in the captive population, a bigger captive population is needed. Therefore, a sufficient number of founders should be at the basis of the captive population. Given a certain number of founders, certain growth rate and a certain level of success in breeding management, studbooks with pedigree information enable managers of captive breeding programmes to determine the ultimate size of the captive population needed to maintain a given level of gene diversity for a

given period of time (Leus, 2011). Further one shouldn't wait to begin a captive breeding programme until the species is in immediate danger of going extinct. Since there are so few individuals in the wild, deliberately removing them to function as founders for the captive population may make the wild population's existence even more precarious. The goal of many zoological institutions has been reevaluated in recent years, with captive breeding and conservation emerging as the primary justification for the institutions' continued existence. Proper nutrition and enclosure enrichment are two crucial elements that affect the success of captive births in a zoo.

Advantages of captive breeding

The world's endangered animals are kept in captivity, in zoos or wildlife parks thus protecting their genetic material from extinction. Reintroductions can support conservation efforts by maintaining high population numbers and reducing genetic drift and inbreeding. Zoologists, veterinarians and others may use captive breeding programmes as a platform for research projects aimed at improving knowledge of the biology of the species, which will benefit conservation efforts. Further captive breeding programmes have significant educational benefit. They are used to educate zoo visitors about the need of biodiversity conservation and increase public interest in conservation issues.

Drawbacks of captive breeding

When there are few founders, harmful alleles are more likely to become homozygous, which can cause inbreeding depression and eventually decrease genetic variation. Reduced genetic diversity in wildlife populations increases the likelihood of their extinction (Saccheri *et al.*, 1998). Unless the members of genetically inferior endangered populations are crossed with members of other populations, they frequently do not show any indications of recovery (Land and Lacy, 2000). Disease outbreaks occur more frequently in captive populations as a result of increased exposure to foreign pathogens. Due to habitat loss or other issues, it might not be possible to reintroduce some species.

Captive breeding in India

Captive breeding programmes in India is taken care by Central Zoo Authority (CZA) for endangered species as per the National Zoo Policy. Captive breeding in the zoological parks of India has prevented the extinction of numerous species. The CZA has identified about 70 endangered species for conservation breeding. Several endangered animals and birds have been successfully bred by the National Zoological Park in New Delhi. At present, this Park is participating zoo for the conservation breeding for many species including Asiatic Lion, Indian Rhinoceros, Sangai Deer, Red Jungle Fowl and the Royal Bengal Tiger. Assam Zoo in coordination with Patna Zoo is involved in breeding of Greater One Horned Rhino in captivity. There are currently 8 rhinos in the Assam Zoo and 13 in the Patna Zoo. In 2004, the first Vulture Conservation Breeding Center was established at Pinjore by the Bombay Natural History Society (BNHS) and the Haryana Forest Department. The programme was later expanded to West Bengal and Assam. The CZA further established 5 more centres. Approximately 345 vultures have been artificially hatched at these centers and over 600 have been released back into the wild. The Madras Crocodile Bank Trust, located in Chennai, is the first crocodile breeding facility in Asia and was founded to preserve three endangered crocodile species in India. The park is also home to other reptiles including Komodo dragons, river terrapin, green anacondas and olive ridley sea turtles. Apart from the ones mentioned above there are many ongoing conservation breeding programmes for other species carried out by zoos all over India recognized by the CZA.

Conclusion

Captive breeding is one of the many methods that conservationists can use to their advantage. Zoos play a vital role in conservation efforts through captive breeding, particularly with regard to species that face extinction in the wild. To effectively maintain and restore these species in the wild, captive breeding must be done in combination with other conservation strategies like habitat protection.

References

1. Wakchaure, R. and Ganguly, S. (2016). Captive breeding in endangered wildlife: A review. *Journal of Biological and Scientific Opinion*, **4**(5): 186-187.
2. Leus, K. (2011). Captive breeding and conservation. *Zoology in the Middle East*, **54**(3): 151-158.
3. Saccheri, I., Kuussaari, M., Kankare, M., Vikman, P., Fortelius, W. and Hanski, I. (1998). Inbreeding and extinction in a butterfly metapopulation. *Nature*, **392**: 491-494.
4. Land, D.E. and Lacy, R.C. (2000). Introgression level achieved through Florida panther genetic restoration. *Endangered Species Updates*, **17**: 99-103.