

The Dangers of Sprinting Change: Ecological, Environmental and Social Impact of Reintroducing the Cheetah in India

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Abstract- The paper examines the origins, and development, and assesses the application of reintroduction efforts in the context of the broader discipline of reintroduction biology. In the first part, it discusses the origins of reintroduction biology and notes its need in a warming world. It also focuses on the recent reintroduction efforts around the world and reintroduces the chief case to be examined through the rest of the paper - the reintroduction of the cheetah in India. In the second part, the paper focuses on larger trends within the science of reintroduction. Relying on secondary research, it notes the volumes of research on reintroduction in the past decades and isolates its themes. It notes the relatively new stage of reintroduction biology and posits explanations for the same. Additionally, it reviews key lessons from past reintroduction efforts from other parts of the world so as to establish a pattern of requirements necessary for a project to be successful. The third part of the paper introduces Project Cheetah and guardedly anticipates the problems it may face as well as the solutions necessary for it to overcome them. The paper concludes by noting the importance of ecological, environmental, and social factors in making reintroduction efforts successful.

Keywords: Reintroduction Biology, Cheetah, De-extinction, Species, Ecological

I.INTRODUCTION

The dangers of climate change and global warming have brought about massive changes in habitat. Such changes in habitat and ecology can have a severe impact on a species and may also increase the chances of their extinction. In such contexts, efforts to conserve species - or more precisely, efforts for *de-extinction* - are urgently needed. De-extinction, as it has been popularly labelled, is applied to a process whereby any species for which DNA can be recovered, from woolly mammoths of the Pleistocene to thylacines and passenger pigeons from the twentieth century. As a part of these de-extinction efforts, the reintroduction of species is also considered to play an important role. Reintroduction, or the release of a previously extinct species into an area in which it had been indigenous before it became extinct, is a long-standing practice with strong historical antecedents. The earliest use of the word "reintroduction" occurring in a conservation context is in an article from 1832 about the return of capercaillie (or capercaillie) to Scotland (Jørgensen, 2013, p.719). The underlying logic seems clear: when species and habitats shrink or disappear, the process known as biodiversity loss, it can threaten food supplies, jobs, economies and human health. It would indicate that having them back would set right this loss.

However, as with other de-extinction efforts, reintroduction raises significant ethical and ecological concerns. For instance, the reintroduction of long-lost species such as the beaver and the lynx in Scotland raises concerns about ecological compatibility and acceptance by members of the community. In fact, there is even contestation over the application of the term reintroduction depending on the time these species have been absent and the nature of the members of this species (Jørgensen, 2013, p.719-720). Additionally, there is the fear that making reintroduction of species normative makes it acceptable for species to become extinct because they can be brought back, and introduced into our natural world again.

The dangers and concerns notwithstanding, the reintroduction of several species into various areas has gained steam. Conservation projects around the world are helping to bring back endangered and extinct wildlife species. In India, the native cheetah population was officially declared extinct in 1952, but cheetahs are now being brought back from Namibia in southwest Africa for India has embarked on an ambitious five-year restoration program. Eight cheetahs have been sent to India to In Britain, wild European bison were recently released into the forests of Kent in southeast England to help with forest management. Elsewhere in Europe, vultures have been reintroduced because they are considered essential to maintaining the balance of nature and quickly cleaning up and recycling the bodies of dead animals. In the southern hemisphere, a critically endangered mammal called the brushtail bettong (also known as woylie) was reintroduced after disappearing in Australia more than a century ago. Reintroduction efforts are therefore taking place all over the world to stop the erosion of biodiversity worldwide (Masterson, 2022). The increasing frequency of such efforts requires consideration of the ethics of reintroduction, the challenges such efforts may face, and how to make them successful and sustainable.

Therefore, the paper focuses on ecological, legal, and economic factors that weigh heavily on the success or failure of reintroduction efforts. An essential way to take stock of all the factors that so exist is to take into account existing literature on the subject, to which we now turn.

II.BACKGROUND

Humans have moved domesticated or captive animals from one place to another for millennia, and there is a well-documented history of wildlife releases to establish new food resources, for biological pest control, and for aesthetic reasons. Increased awareness of reintroduction as a viable conservation option was enhanced by the high-profile reintroductions of a few charismatic vertebrates in the 1970s and 1980s, including the Arabian oryx (*Oryx leucoryx*) in Oman, golden lion tamarins (*Leontopithecus rosalia*) in Brazil, and Peregrine Falcons (*Falco peregrinus*) in North America. Reintroductions are an attractive option for generating publicity, particularly because handling, transport, and release of animals are media-friendly events and show concrete action being taken by concerned authorities, whereas the subsequent fates of reintroduced populations attract little media attention. The available data for wildlife reintroductions in the 1970s and 1980s suggest the majority failed to establish viable populations (Seddon, Armstrong & Maloney, 2007).

To examine trends in reintroduction research, Seddon et al. compiled a list of 515 reintroduction-related papers published since 1935 by combining the results of searches on Biblioline Wildlife and Ecology Studies and Web of Science. I searched with the keyword "reintroduction". Between 1942 and the late 1970s, publications tended to decline, followed by a modest increase in the number of publications until the late 1990s, and a relatively recent and substantial increase after 2000. They divided the research into three approaches and argued that the reintroduction of biology as a scientific field is still largely at the stage of inductive reasoning, in which observations about particular taxa are collected and organised to infer patterns of association and the origins of such patterns are suggested. It concluded that it was in the stage of exploration. As a result, so far the focus has mainly been on accessible and easily measurable elements of the resettlement process, such as emancipation techniques rather than factors that may be more important for the establishment and long-term survival of new populations. The derivation process necessarily requires specific knowledge of species and systems, but should also include more general theory if it is to be reintroduced as a discipline. This theory need not be fresh from the field of reintroduction but should draw on theories from population ecology, animal behaviour, genetics, and other fields (Seddon, Armstrong & Maloney, 2007).

The limitations in knowledge also cause a limitation in practice. There have been several reintroduction projects in the past that have failed to be successful and viable. Oded Berger-Tal, an Israeli ecologist, led a large-scale analysis of reported reintroduction projects that showed that failures follow definite patterns and suggested measures that could be avoided in order to improve the success rates of such projects in the future. There is a further political impetus that prevents biologists from classifying such projects as failures which blocks literature that classifies projects as failures. Learn, 2019 writes:

They found that only about 3% of all reported cases were actually declared failures. But most of the time the authors themselves are dictating the terms of potential failure or success. The real story was apparent in the "difficulties" section listed in each case study, he said. Projects sometimes labeled as a "partial success" may have involved the death of all animals within a few months of release, but researchers said they at least learned how to breed the animals in captivity in the first place (para. 7).

The problem of hidden failures plagues the entire practice of reintroduction biology. Many have been unable to sustain a wild population owing mostly to contamination which results in a higher death rate. Berger-Tal discovered over 1,200 difficulties potentially involved in reintroduction efforts through his examination of case studies ranging from electrocution to civil unrest. The biggest issue was wildlife monitoring after animals are released followed by adaptation difficulties owing to new habitats and ecology (Learn, 2019).

The *Global Reintroduction Series* over the course of six issues examined up to three-hundred-and-forty-nine case studies, with six case studies of invertebrates, four case studies of fish, three case studies of amphibians, five case studies of reptiles, six case studies of birds, eleven case studies of plants, and twenty-four case studies of mammals. Out of all these cases, the cases of lion translocations in Botswana and sea otter reintroductions in North America are of particular interest. In the former case, researchers aimed to examine whether translocated lions return to the area from which they were captured, and if not, then what adapting looks like with a particular focus on the fate of translocated lions. When lions frequently kill livestock, especially far from reserves, finding solutions to help farmers and keep them alive becomes increasingly difficult. The reintroduction accordingly, faced major difficulties - lions, especially females, often quickly returned to their original home ranges, Botswana lacked areas suitable for lions that did not already contain healthy lion populations, wildlife fences in Botswana failed to inhibit the movement of lions, and only single lions were captured and translocated even if they were part of a group. The major explanation for failure involved female lions displaying homing behaviour, none of the translocated lions survived more than two years following translocation, they continued to prey on livestock as they moved into new areas that contained livestock, and translocation occurred into areas that already contained resident lions (Maude et al., 2018).

Such lessons from previous reintroduction projects can have an important bearing on the relocation of the cheetah from Namibia to India which we now examine.

III.DISCUSSION

India is no stranger to reintroductions, for it has previously reintroduced the species of tigers and gharials in India. Whilst such projects have faced considerable ecological and attitudinal difficulties (Sinha et. al, 2018 & Krishnamurty et. al, 2018), the recent nature of the relocation of the cheetah makes any conclusive evaluation impossible. Even then, we can make certain educated guesses of what the project would need in order to succeed.

India welcomed four new-born cheetah cubs in late March 2023 — more than 70 years after the world's fastest land mammal was declared officially extinct in the country. Another twelve cheetahs were brought from South Africa in February 2023, in an agreement between the two countries, and put into quarantine enclosures. Project Cheetah aims to reintroduce India's only extinct large mammal, the cheetah. As part of the project, 50 cheetahs will be reintroduced to various national parks over five years. The cheetah is the only large carnivore in India to be completely extinct, largely due to overhunting and habitat loss. The action plan underscores the country's desire to bring back the cheetah. Cheetahs live in open plains. Their habitat consists primarily of prey habitats: grasslands, scrub and open forest systems, semi-arid environments, and temperatures that tend to be warmer than cooler climates. Saving cheetahs requires saving not only prey, including certain endangered species but also other endangered species in endangered grassland and forest ecosystems. It has also been observed that the conflict with human interests in cheetahs is the lowest among large carnivores. It poses no danger to humans and does not attack livestock. Kuno Palpur National Park (KNP) in Madhya Pradesh received the highest rating among the 10 Central Indian states surveyed. KNP is 748 square meters. km. The area is free of human habitation and is part of the open deciduous forests of Sheopur and Shivpuri and is estimated to be home to 21 cheetahs. Other parks where cheetahs are expected to be gradually reintroduced include Nauradehi Sanctuary, Gandhi Sanctuary, Shahgarh Bulge, and Mukundala Sanctuary (Ministry of Environment, Forest, and Climate Change, 2022).

However, reintroduction can pose challenges, including the fact that cheetahs are a widespread species and are known to migrate up to 1,000 km². in just one year. Indian parks tend to be much smaller than African parks, so there is little opportunity for such free movement. And while the habitat is now suitable for cheetahs and lions, some fear it will eventually evolve into a dry forest better suited to tigers. There is also credible evidence that tigers are already spreading to Kuno Palpur as animals in reserves in neighbouring Rajasthan seek to escape territorial overcrowding. This suggests a working wildlife corridor between the two reservations, which is said to be a priority for Native American conservation. There is currently no scientific evidence to suggest that cheetahs, lions, tigers, and leopards can easily coexist in the same habitat (Evans, 2020). Experts also point out the insufficiency of this move to conserve grassland and that of conserving other threatened species such as the caracals and the Great Indian Bustard (Deshpande, 2022). Further, Project Cheetah feels more like a vanity project than a conservative imperative and if handled correctly, may present a threat of conflict between species.

In order for the cheetah reintroductions to be viable, the authorities need to make sure that there is enough grassland for the cheetahs to live on, enough prey to feed on, and engage in close monitoring post-reintroduction for human-animal conflict as well as animal-animal conflict - all three of which factors were involved for the failures of the reintroduction products in Botswana and India. Accordingly, there needs to be more investment in infrastructural facilities, vocational training, and labour upskilling. There also needs to be legal clarity on Project Cheetah. For instance, there are doubts whether the African Cheetah, exotic to India, will fall under the Wildlife (Protection) Act, 1972 or not as the Act covers only species native to India. Another grey area is the status of the KNP as a 'zoo' or a national park since the KNP is also meant to hold the cheetahs for public exhibition. Such economic, environmental, and legal factors need to be ironed out so as to reduce discrepancies and make reintroduction a success.

IV. CONCLUSION

Therefore, the essay has thus examined the origin and need for reintroduction efforts as emerging from early studies in the 19th century. Despite the long-standing history of reintroduction in de-extinction biology, the field of reintroduction is still in an exploratory stage with many prerequisites for reintroduction success unmapped. Previous reintroduction efforts across the world represent a mixed bag with some being successes and some being failures. A big obstacle in the way of the development of the discipline is the political pressure that scientists often feel when reporting a failure. In order for the reintroduction of the cheetah to be a success, particular attention needs to be paid to reintroduction projects in Botswana and the gharial reintroduction in India as they underline some of the difficulties that experts have anticipated may plague Project Cheetah - limited prey, limited infrastructure, limited access of movement, and insufficient monitoring. Additionally, there exists the possibility of human-wildlife conflict as was evident in Botswana and this further necessitates a clarification on the legal issues necessary for deciding such disputes such as which laws cover the project.

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