



BEAR CONSERVATION

Sloth Bear Genetic Diversity by Annabella Helman



Indian Sloth Bear with cubs in Daroji Bear Sanctuary, Karnataka, India
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Introduction

Genetic diversity is a crucial component of biodiversity and of the viability of a species' population. It is one of the fundamental necessities for overall biodiversity and the sloth bear provides a perfect case study to discuss the importance of range management and to explore the issues surrounding habitat fragmentation.

Fragmentation to Extirpation?

The sloth bear is one of 8 species of bears and is distributed in Central India and the Eastern Ghats landscape (Dharaya, 2016). Like most bear species, sloth bears are omnivorous, and as a large bodied mammal, require a large range (Dharaya, 2016). As India has one of the largest human populations in the world, habitat encroachment and fragmentation have become commonplace in the sloth bear's habitat (Dutta, 2015). The distribution of sloth bear populations is entirely

dependent on the distribution of forest cover (Garshelis, 1999). Extirpation, or local population extinction, becomes a rising concern as genetic diversity decreases.

One of the biggest causes of genetic drift is habitat fragmentation. While sloth bears have areas of protected habitat, losing the edge forests that surround protected areas causes population fragmentation creating separate, small populations in the parks that could quickly become nonviable (Garshelis, 1999).

Could Corridors Connect?

The obvious solution to the issue of fragmentation would be to connect the fragments and many conservationists are in support of this management practice as a general solution to fragmentation issues. For many species biological corridors are becoming a celebrated strategy and can be beneficial, however determining the efficiency of biological corridors, the most widely used form of connecting fragments, requires an understanding of the target species' movement patterns in context with the landscape as well as the probability of individuals entering a habitat patch via corridor (Rosenberg, 1997). Because of the contextual nature of corridor use, more research of the sloth bear and its movement patterns is required before any money is spent on these efforts.

Cases Across Species

Implementations of linear biological corridors has become a standard land management practice to support inter-fragment movement of small bodied species, but research on larger mammals using corridors is relatively new and insufficient. In Florida, proposed corridors intended for black bear use were turned down by governmental conservation groups who argued that the connection of fragments would disperse invasive plant species in protected areas. This was done despite the encouragement from of the bear biologists in the area (Simberloff, 1987). A more general concern is the question: will these species actually use the corridors that are put in place? In the Canadian Rocky Mountains, detailed research and analysis supported by NGO's and the concerned public have identified the most cost-effective and high impact corridor implementation that mitigated grizzly-human conflict like traffic casualties and fatal human encounters (Chetkiewicz, 2009).

Recommendation to Revise

These two cases reflect the difficult nature of the problem of habitat fragmentation: no two cases will have the same stakeholders, context, or resources available to implement an effective corridor. The problem of the fragmentation of the sloth bear habitat should then be approached with specific care in order to understand the complex ecosystem, possible invasive species, and the actual movement patterns of each population. Both scientists and the public should be invested in the need for more information and research before land managers initiate biological corridor projects. The sloth bear could benefit greatly from connection fragments with biological corridors, but in order to prevent a waste of money and resources or the spread of invasive species to protected areas, a detailed investigation should be the first step.

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Published by Bear Conservation 9 June 2019