Revealing partial migration in African elephants

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Abstract

Migration is a fascinating phenomena with important ecological and conservation implications. Simultaneous migration of whole populations are rare, but in recent years it has been recognized that partial migrations, when only some of the individuals of a population migrate, are common. In partial migration systems, timing and routes of migration also often vary widely between individuals. Characterizing and quantifying this variability is challenging and there is no established practice yet. Here we present an approach based on the identification of a 'migration axis', on the distance migrated and on the seasonality of migration, combined with standard multivariate and clustering techniques. We then show the application of this approach to movement data of 33 GPS-tracked African elephants, monitored in Hwange National Park (Zimbabwe). The analysis reveals clusters of individuals which were distinguished primarily by the distance migrated, and secondly be the seasonality of the migration. Long-distance migrants moved out of the Park and in a neighbouring country in the wet season. We discuss these results in the context of the emergence of Transfrontier Conservation areas, and we question the origin this migration which would not have made ecological sense a 100 years ago.

Keywords: Migration, Method, Elephant

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