Responses of the Serengeti avifauna to long-term change in the environment

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Abstract

In this paper we examine how climate change interacts with other disturbances to alter the functioning of a tropical ecosystem, the Serengeti in Tanzania. Tropical Africa has increasing temperatures and changes in rainfall. Long-term data have shown how the avifauna responds to the interaction of environmental change with other disturbances: (1) habitat modification through agriculture by limiting endemic species and top trophic levels. Rare species are lost so this is a problem for conservation. Top trophic levels are lost and the lack of predators then releases pests. This is a problem for natural resource management. (2) Disease and hunting cause slow change in the species complex. This can alter community dynamics depending on which species enter or leave. (3) Habitat fragmentation or decay can cause slow change. When this reaches a threshold there may be rapid change in the species composition causing multiple states. One lesson is that present-day ecosystem states and trends can only be understood in the context of past historical events. Another is that all systems change so this requires a new approach to conservation. Within protected areas, new boundaries or new areas will be required. Outside rewilding is required to support more biodiversity.

Keywords: agricultural disturbance, climate change, forest regeneration, fragile species, granivores, insectivores, raptors, resilient species, Serengeti avifauna