

2016-2017 Field season report



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Project title: An ecological study of the critically endangered Taita apalis (*Apalis fuscigularis*) in fragmented Afromontane cloud forests of Kenya:

Altitudinal differences in food availability, prey choice, provisioning rates and nest plant use

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Fieldwork period 10 November 2016 to 4 January 2017

Introduction

Montane species are at high risk of extinction from climate change as they are restricted to their montane habitats and they may lose suitable habitat due to changes in precipitation and increasing temperatures. The climatic stability of the ancient Afromontane cloud forests in Eastern Africa has enabled some species, which would normally be defined as mobile organisms, to stay in the mountains throughout the year for reproduction and survival. In the Taita Hills in Kenya, the northern-most mountain block in the biodiverse Eastern Arc Mountains, not only climate change threatens the rare Afromontane species. Habitat destruction, fragmentation and human disturbance are causing loss of habitats and threatening the survival of rare endemic animal- and plant species. Meanwhile, a small endemic songbird, the Taita apalis (*Apalis fuscigularis*, critically endangered), persists in very few fragmented Afromontane cloud forests in the Taita Hills in Kenya. The Taita Hills are the most severely fragmented mountain block in the Eastern Arc Mountains; they have experienced approximately 98% forest loss over the course of 200 years. In the past century, forest destruction and conversion into unsuitable exotic tree plantations are causing further pressure on the species. The Taita apalis has disappeared from several low altitude forest

fragments, and currently remains in four tiny remnant forest fragments, where the subpopulations at higher altitudes are doing better, while subpopulations at lower altitudes are declining or have gone extinct. Only at higher altitudes in Msidunyi and Vuria there are high levels of human disturbances, where the land has not yet been gazetted as forest reserves despite being the strongholds of the Taita apalis population. The forest fragment and forest reserve Ngangao, currently holding a subpopulation of Taita apalis at the lowest altitudes, is experiencing little or no disturbance. The breeding season of the Taita apalis starts around the onset of the short rainy season in November. Variation between altitudes occur, as the breeding season at higher altitudes begin app. one month before lower altitudes and ends one month before the end of the low altitude breeding season. Food availability is a major determinant in the onset of the breeding season of tropical birds, and food shortage could lead to lower nest attendance, lower female body size and thus lower nestling survival. This aim of this study was to investigate the cause of the decline at lower altitude; are there any differences in the availability and quality of food (invertebrates) available between high and low altitude forest fragments?

Fieldwork

I used camera traps provided by the Royal Society for the Protection of Birds (RSPB) to study provisioning rates and the food items brought to the nestlings by the parent birds. The work included deploying the cameras in front of active Taita apalis nests in the field and checking the equipment regularly to change batteries and memory cards. Invertebrates were sampled in the breeding territories of Taita apalis every month with sticky traps and sweep nets in high and low altitude forest fragments. Samples were identified to order, counted and measured at the field station. Furthermore, I included data on breeding success, fledgling size, nest plant use and relative predation rates to add more dimensions to my study.

Challenges

The breeding season 2016-17 was under effect by La Niña, which resulted in far less rainfall during the breeding season. The breeding was delayed in all fragments, most notably at lower altitudes. It proved a

big challenge to find enough active nests at low altitude to get enough data for the food provisioning rate and prey choice analyses. Luckily, I was able to continue data collection as my supervisor and I hired a field assistant and student assistant to assist with data collection from November 2016-March 2017. I regret that I did not put more time aside for fieldwork; two months were not enough time to collect data, especially not when you have unforeseen events. The camera traps also proved a challenge as the equipment would not always work, and we even had some equipment stolen in the field. Other challenges were that locals would bring cattle to graze inside the territory of a breeding Taita apalis, which would cause disturbance and possibly destruction of nest plants. In conclusion, my fieldwork was successful, and enough data was collected for my master's thesis.

Outcome

Some interesting data was collected during the fieldwork season, and we will be work towards publishing the results from my thesis in an appropriate scientific journal. We continue to raise awareness towards the Taita Hills and their high levels of endemism; through popular articles and reports we will stress the importance of securing land to protect the remaining Taita apalis. The project outcome also emphasized the importance of protecting the subpopulations at higher altitudes, despite their subpopulations being more stable, as there is an increasing demand for farmland due to increasing population density. The solution to this is protecting the land through the establishment of forest reserves in Vuria and particularly Msidunyi. The Rainforest Trust is working towards this [by raising funds for a Taita Apalis Forest Reserve](#), while their partner Nature Kenya is searching for land in Msidunyi to buy. The importance of the higher altitude forest fragments also raises awareness on the restoration of indigenous forest in the fragment of Yale, which currently holds 1-2 breeding pairs of Taita apalis. The forest in Yale consists of exotic plantation forest, that researchers have found to provide unsuitable habitat for Taita apalis, but the fragment holds potential for restoration. This is because the fragment is right in the middle of Ngangao, Msidunyi and Vuria and will play a part in future restoration of habitat connectivity between the fragments. Another important outcome was to determine plausible causes of the decline of the subpopulation in Ngangao at lower altitude.

Restoration of former Taita apalis breeding sites and connectivity of fragments would increase the species' possibility of survival. During my fieldwork we often engaged with the locals and explained the importance of conservation work on the Taita apalis, as well as protecting the remaining indigenous forest and other forest creatures of the Taita Hills. Due to the success of the camera traps from the RSPB, we were kindly given color cameras again by the RSPB to study the nest predators of the Taita apalis. The camera trap pictures taken in the 2017-2018 breeding season may also provide additional vital data on provisioning rates and prey delivered to the nestlings by the parents.

Finally, climate change, food shortage and increasing frequency of fires may be the biggest threats towards Taita apalis and other rare species of the Taita Hills in the future. The research project will benefit other tropical montane species through increasing knowledge regarding habitat use, conservation and other requirements essential for breeding activities of montane species.

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