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Northward extension of the known range of the Bush Pipit *Anthus caffer blayneyi* in Kenya and preliminary evidence for a northern breeding population

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Summary

The Bush Pipit *Anthus caffer* is a partly nomadic African species whose movements coincide with the onset of rains. Across the continent, the distribution and geographic extent of the five Bush Pipit subspecies are poorly known. In Kenya, the documented range of the Bush Pipit is along the Tanzanian border in the southwest of the country. We provide evidence of a previously undocumented population of Bush Pipits in Laikipia District, Central Kenya that may have been overlooked due to difficulty in identifying this species. It appears that this population may constitute a seasonal influx related to an increase in local primary productivity. However, we also provide preliminary evidence that this species may breed in Laikipia during December–January, while it has been reported that it breeds during March–April in Kenya. Nonetheless, we could not completely ascertain based on this short study whether or not Bush Pipits are year-round residents in Laikipia.

Introduction

In Africa, the Bush Pipit *Anthus caffer* is an endemic resident that is partly nomadic; its movements coincide with the onset of the rains (Fry *et al.* 1992, Zimmerman *et al.* 1996). It has a disjunct distribution from southern Ethiopia south to South Africa and west to Angola (Fry *et al.* 1992). The extent of its distribution is uncertain and the geographical variation and limits of the races are poorly understood (Clancey 1991, Tyler 2004). Five subspecies have been described, and an additional one or two sub-populations may warrant subspecies status (Clancey 1990).

The uncertainty of Bush Pipit distribution is likely exacerbated by the difficultly in identifying this species in the field. This small to medium-sized pipit is described as having streaked brown upperparts and white outer tail feathers (Zimmerman *et al.* 1996). The upper mandible is dark brown and the lower mandible is pale horn, legs and feet are light brown, the hind claw is short and curved, and the sexes are alike (Fry *et al.* 1992, Tyler 2004). The East African subspecies *A.c. blayneyi* differs from the nominate race in being

smaller, having upperparts lighter, more sandy buff, rump streaked, face buffier and belly whiter (Clancey 1990, Fry *et al.* 1992).

In southern Kenya and northern Tanzania, *A.c. blayneyi* is described as uncommon (Fry *et al.* 1992). Sight records in Kenya come from the areas of Lolgorien, Loita, Kajiado, Konza, Simba, Ngong and the Masai Mara Game Reserve (Reynolds 1979, Finch 1989, Lewis 1989, Lewis & Pomeroy 1989, Pearson 1989, Fry *et al.* 1992, Zimmerman *et al.* 1996), all areas well-south of the equator (Fig. 1). The breeding behaviour of the Bush Pipit is also poorly known, but laying dates in Kenya have been documented as March-April (Tyler 2004).

The Bush Pipit inhabits wooded savanna or open woodland with sparse ground cover, often with bare patches or scattered rocks up to 2200 m (Tyler 2004). It can often be found in grasslands that have been seriously overgrazed by ungulates (Clancey 1990). Like other pipits, it forages for insects on the ground among leaves, in grass or on bare patches. Its prey consists of small insects and other invertebrates. It feeds alone or in pairs and occasionally in loose flocks outside of the breeding season (Tyler 2004).

Here we provide evidence for a northward extension of the known range of the Bush Pipit in Kenya and link their largely seasonal movements to increases in primary productivity. Further, we provide preliminary evidence of an individual Bush Pipit breeding during January in Laikipia.

Methods

Study site

Field data were collected at *c.*1800 m in Laikipia District, central Kenya (Fig. 1). The area is semi-arid acacia savanna with rainfall averaging 500–650 mm per year (Mpala Research Centre, unpub. data). The rainfall pattern can be described as weakly tri-modal with the highest peak in mean precipitation occurring from March through May with lower peaks in August and from October through December. All study sites were located on "black cotton" soils, where approximately 95% of the trees are *Acacia drepanolobium* and five major perennial species dominate the grass layer (*Themeda triandra*, *Brachiaria lachnantha*, *Pennisteum stramineum*, *P. mezianum*, and *Setaria sphacelata*).

Study sites were spread across four neighbouring cattle ranches: Mpala, Jessel, Segera, and Ol Pejeta Conservancy. All four are privately owned, wildlife-friendly cattle ranches with large concentrations of wildlife and moderate densities of livestock. The avian fauna in the four study areas comprised *c.*183 species (NCG unpublished data).

Bird Surveys

Surveys were conducted as part of larger research projects that assessed the impacts of large ungulates (Ogada *et al.* 2008) and the effects of fire and temporary cattle corrals or *bomas* (Gregory *et al.* 2010) on bird communities.

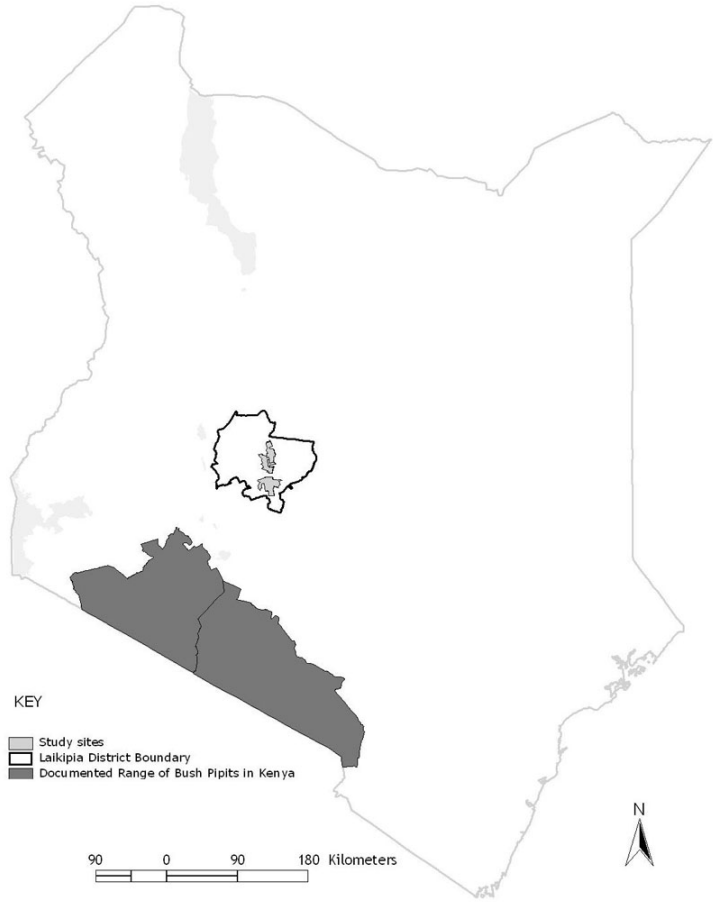

Figure 1. Map of Kenya showing location of Laikipia District and the study area. Dark grey areas show extent of currently documented range of Bush Pipits in Kenya.

Surveys were conducted monthly from February 2001–February 2002 and every 3 months from March 2002–February 2003. In 2006–07, surveys were conducted between February and March and between June and August. In total, we surveyed 27 months during February 2001–August 2007.

2001-2003 surveys: DLO conducted surveys using the point-count method from the centre of 18 experimental plots each measuring 4 ha. Surveys were conducted monthly with the exception of November 2001 when no surveys were completed due to heavy rainfall. A survey consisted of two 30 minute sessions on each of the 18 plots. The first session was conducted between 07:00 and 09:00 and the second session between 16:00 and 18:00. Because there was no difference in pipit abundances between plots, surveys from the 18 plots were pooled for each month.

2006-2007 surveys: NCG conducted surveys on three 1-ha, five 9-ha, and four 81-ha plots that were burned experimentally in 2004 and 2005 as part of the Scale and Fire Ecology (SAFE) project. Surveys were also conducted on four newly abandoned bomas (<2 years old). With age, bomas become

treeless glades that can persist for decades. Four glades estimated to be between 5 and 10 years old and 4 glades between 20 and 30 years old were also surveyed as were control plots in undisturbed matrix habitat. All surveys were conducted by the fixed-width transect method; two transects originated in the centre of each plot and ran 200 m to the corners of the treatment. Surveys were conducted between 06:30 and 10:00 when birds were expected to be most active.

Specimen identification

One dead Bush pipit was opportunistically collected on 19 January 2010 by DLO. It was found dead at the base of an electric fence at the Mpala study site. Photographs and standard biometrics were taken according to the techniques described in Sutherland *et al*. (2004). Measurements were taken three times and the mean is reported.

Primary production

Rainfall fluctuated significantly between seasons and years of the study and was quantified by the Normalized Difference Vegetation Index (NDVI) where greater NDVI values indicate greater primary productivity (Box *et al.* 2004). NDVI data came from the Livestock Early Warning System (LEWS) (Stuth 2009) monitoring sites on Mpala, Segera, and Ol Pejeta Ranches in Laikipia District.

Data analyses

Due to unequal sampling effort, we report the relative abundance of Bush Pipits seen each month. Relative abundance was calculated by dividing the number of individuals observed by the total number of birds observed for each month.

Results

Bird surveys

Over four years of surveys we recorded 77 Bush Pipits in 52 separate sightings (n = 14 278 total bird sightings). Bush Pipits were observed most often during June–September, which followed periods of peak vegetation productivity (Fig. 2). In both studies, groups of >2 Bush Pipits were observed only during July and August. One group of four individuals was seen during July, and four groups of three individuals observed during August.

Specimen identification

The specimen was moulting a tail feather but not its wing feathers. It had a brood patch. Measurements of the specimen are shown in Table 1. The photograph in Fig. 3 shows the extent of streaking on the underparts, the white outer tail feather, the differences in colour of the mandibles, and the length and curvature of the hind claw. The specimen was lost before it could be deposited at the National Museum.

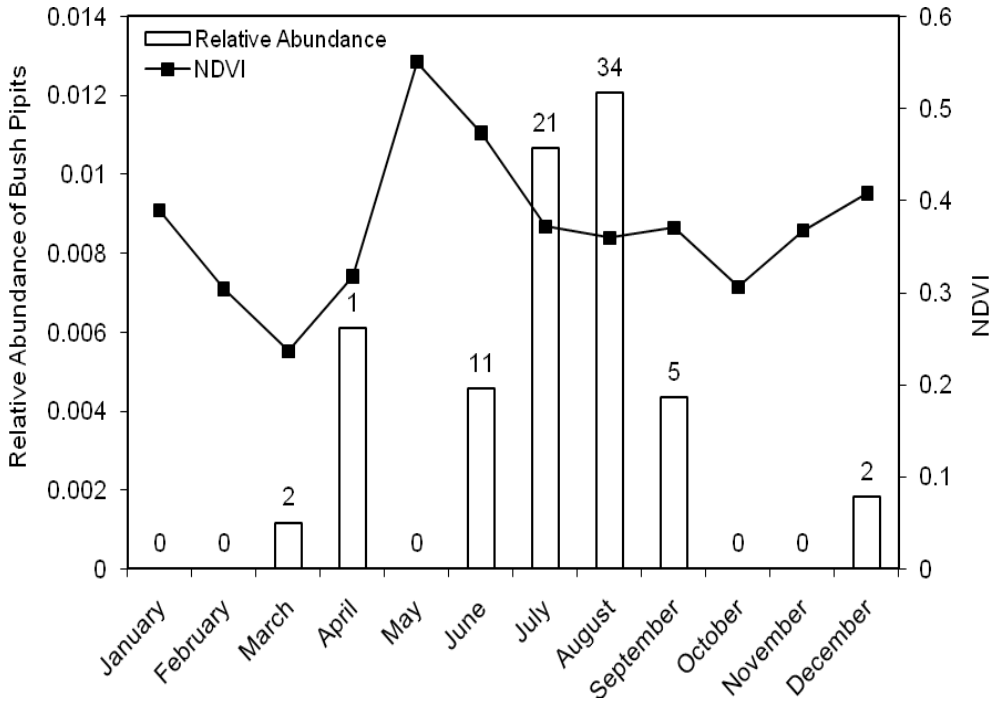

Figure 2. Relative abundance of Bush Pipits per month (for all surveys) observed in Laikipia District compared to mean monthly NDVI for Laikipia. Numbers above the bars indicate total Bush Pipits seen per month.

Table 1. *A.c. blayneyi* measurements from Mpala Research Centre (MRC), Laikipia District, Kenya compared to published measurements for *A.c. blayneyi, A. blayneyi* and *A.caffer*. It should be noted that the names *A.c. blayneyi* and *A. blayneyi* refer to the same subspecies of *A. caffer*. The names reflect the differences in scientific nomenclature used at the time the references were published. All measurements are in mm except where otherwise noted.

	Sex	Total length	Wing	Tail	Tarsus	Hind claw	Bill	Wt (g)
MRC specimen	female?	121.1	66.8	38.5	20.3	13.1	12.8	14.8
A.c. blayneyi [a]	male		67.7					
A. blayneyi [b]	male		68–70					
A. blayneyi [b]	female		65–67					
A.caffer [a]	male		74–78	47–53	17–19		15	16
A.caffer [a]	female		72–75	44–53	17–19		14–16	
A.caffer	unknown	125-135[b]				6–8 [a]		16 [a], 16–18 [c]

[a] Fry *et al.* 1992

[b] van Someren 1919 (range of measurements based on 10 total specimens for both sexes)

[c] Tyler 2004

Figure 3. Photograph of Bush Pipit collected at Mpala Research Centre.

Discussion

Though an uncommon species in Kenya, Bush Pipits are seasonal visitors to Laikipia and based on the brood patch found on the single collected specimen they may breed there too. The extent to which they may be year-round residents in Laikipia could not be ascertained from our study and requires further investigation.

Our observational data suggest that Bush Pipits are commonest in Laikipia during June-September following the long rains and the subsequent increase in primary productivity. This is likely to take advantage of the seasonal abundance of insects during this time (DLO and NCG unpublished data). Primary productivity exerts a strong positive influence on bird abundance (Dean & Milton 2001, Schaefer *et al.* 2006, Gregory *et al.* 2010). Bush Pipits were uncommon at other times of the year, being recorded only five times during the rest of study, and one collected specimen. Additional observations in Laikipia outside of the months of June-September include three individuals at Sosian Ranch during January 2011 (B. Finch pers. comm.). Though generally a solitary species, groups of >2 individuals are known to occur outside the breeding season (Fry *et al.* 1992). Observations of >2 pipits only occurred during July and August when their numbers were at their peak in Laikipia.

Based on the fact that the specimen we collected in January had a brood patch, the laying dates for this species in Kenya (March–April) may warrant revision if further evidence for breeding during this time of year can be substantiated. In addition, the existence of a brood patch in this specimen suggests that Bush Pipits may indeed breed in Laikipia, but this requires

further investigation.

Although we were only able to measure one Bush Pipit, the measurements fall within the range for *A.c. blayneyi* and mostly within or below the range for the larger *A. caffer*. More specifically, the wing measurement falls within the range of female specimens of *A. blayneyi* as reported by van Someren (1919). Furthermore, our specimen had a brood patch and although there is no published information on whether one or both sexes incubate in this species, another pipit within this genus is reported to be incubated only by the female (Rauter & Reyer 1997). Based on this evidence, we suspect that our specimen was female.

It is surprising that the occurrence of Bush Pipits in Laikipia has remained undocumented until now. There may be a number of reasons for this. It could represent a genuine recent range expansion due to degradation of their habitat or other critical resources in their known range in the southwest of the country. However, given that Bush Pipits are partially nomadic and their distributions are poorly known (Fry *et al.* 1992, Tyler 2004), it is more likely that they were overlooked in Laikipia because their populations are small, probably seasonal, and the species is cryptically coloured and difficult to identify.

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