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AVIAN BIOLOGY

LIVING IN ISOLATION - OBSERVATIONS ON AFRICAN ROCK PIPITS IN THE NORTHERN CAPE

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The conservation status of the African Rock Pipit (*Anthus crenatus*) has been recently classified as "Near Threatened" in 'The 2015 Eskom Red Data Book of Birds" (Peacock 2015). Adding to this, small populations on isolated mountains are considered to be vulnerable to effects of climate change and it is estimated that this species may suffer range contractions in the future.

The African Rock Pipit (ARP) is an endemic species to South Africa, Lesotho and also possibly occurs in western Swaziland. It has a continuous distributional range along the main escarpment of South Africa, with a few isolated populations in the Northern Cape Province and in the Nigel area in Gauteng (Voelker 2005; map Appendix 1). ARPs are associated with mountainous areas, karoo hills and escarpments with rocky hills preferring open areas with adequate grass cover and boulders used as song posts. The largest populations in the Northern Cape occur in the Hotazel and Groblershoop areas and smaller, isolated populations occur in areas around Kimberley, Springbok, Keimoes and mountains in the Postmansburg region. This article discusses some observations on the population size, habitat preferences and behaviour of ARP at the Tswalu Kalahari Reserve (Kuruman area) and in the Groblershoop areas. As part of an ongoing study on the individual and inter-population variation in vocalizations and behaviour of ARP, two of the larger isolated populations in the Northern Cape were studied to obtain comparative data on this species (see de Swardt 2010).

Figure 1 *- The rocky terrain on the higher slopes of Gossberg near Debeden in Tswalu Kalahari Reserve. The combination of large boulders, small rocks, grass tufts and small shrubs is the ideal habitat for African Rock Pipits in these arid areas of the Northern Cape.*

African Rock Pipits of Tswalu Kalahari Reserve

Tswalu Kalahari Reserve lies within the Korannaberg mountain range in the Hotazel / Kuruman area of the Northern Cape. The ARP's distribution extends from the hills in the northern parts in the Sunstroke area (known as Tower Mountain), southwards to Gosberg, Doornberg and Debeden, Tarkuni Valley and the most southerly

point (Verwater) is near the Langberge, west of Olifantshoek. Here they are restricted to the rocky slopes with adequate grass cover and scattered shrubs, on mountain-sides and isolated hills of the Korannaberg range (see habitat photos Figure 1 and 2). Their habitats are surrounded by an undulating ocean of *Vachellia mellifera* and red Kalahari sands.

Figure 2 *- Another rocky part of the hills surrounded by Vachellia mellifera in the Gosberg area in Tswalu Kalahari Reserve (Photo: Tania Anderson).*

African Rock Pipit territories on these mountain islands are relatively large and often encompass higher altitude zones of the mountain slope. Playback of ARP song was used to locate territorial males, and their presence was also recorded by walking arduous transects on the mountain slopes. When a bird responded to playbacks, typically by flying to a prominent boulder and singly loudly, its behaviour was observed and documented. Birds were also observed walking on the small rocks on the mountain slope (probably foraging) which are concealed by the grass tufts (Figure 3).

Figure 3 *- Foraging African Rock Pipits are sure-footed and nimble while foraging in their rocky haunts. During the earlier parts of the day, pipits were observed jumping from rock to rock and also walking on the larger rock boulders as this individual is doing at Picnic Valley at Tswalu Kalahari Reserve.*

Interestingly, the birds here are not as vocal during the day as in Free State localities – probably due to the Northern Cape's extremely high summer temperatures. They became less active and vocal from about 11:00 onwards, and then kept mostly to the shade cast by bushes and rocks in order to avoid the searing direct sunlight. That being said, I encountered a singing bird at 15:00 on a December afternoon near Debeden, near the summit of the hill at an altitude of 1350 metres (ARPs usually occur above the 1200 metre contour line). At Tswalu, a total of 12 territories were located at the different isolated hills, and recordings were made of these birds' songs. Territory size of two territorial males was estimated to be 5.7 and 5.24 hectares, respectively.

African Rock Pipits in the Groblershoop area

In the Groblershoop area, the African Rock Pipit occurs in the Skurwe Mountain range, a series of hills north of the Orange River stretching approximately 60 kilometres northwards towards the Olifantshoek road. Here the species occurs in the Dinasrus area and nearby Prynnsberg Mountains and the more distant hills in Kalahari Oryx Reserve, and extends northwards towards Witberg and Tweepoort in the Warmberg, Skeurberg and also possibly in the hills north of the N14 (farms Welverdiend and Miershoop Holte) (de Swardt 2013) (see habitat figures 4 & 5). The hills east of Witsand Nature Reserve on the Bergenaarspad Pass is another area where this species possibly occurs, and surveys are needed here. In the Groblershoop area, the ARP's habitat is similar to that at Tswalu, but with larger areas of exposed rock plates, and summits and plateaus characterized by large sections of exposed bedrock with very little grass cover. As in other parts of the Northern Cape, these isolated mountains and rocky kopjes are islands from a pipit's perspective, and are isolated by red Kalahari sands and dominated by *Vachellia mellifera* and *Rhigozum trichototum* (Driedoring) shrubs. Surveys for African Rock Pipits were conducted at Dinasrus, La Grattitude (in Kalahari Oryx Reserve), areas of Prynnsberg and further north at Tweepoort in Kalahari Oryx Reserve. A total of nine different ARP territories were located and the territory size of one male in the Prynnsberg area was estimated at 1.7 hectares. These birds were observed mostly above the 1000 metre contour line. Territories at Prynnsberg were smaller than those observed at Tswalu and also spaced closer to each other (ca 300 – 500 metres).

Figure 4 *- The Dinasrus farm, with the Prynnsberg mountain range in the far background, in the Groblershoop area of the Northern Cape.*

Behaviour and song variations in islands of rocky hills

The unmistakable and evocative song of the African Rock Pipit starts with a whistle-like call which flows into a stuttered trill. The song can

be described as a two-syllable "*wheee-tsreeeu*", which is repeated several times during a song bout (i.e. the time period when the undisturbed bird vocalizes). Careful analysis of sonograms of recorded vocalizations revealed a surprising degree of variation in the song structure. Several song-types are identifiable, differing mainly in whether the second element is at level frequency or descending. The song recordings obtained at the Tswalu and Groblershoop study sites were found to differ from other sound recordings of ARP obtained in the core parts of the species' range in the Free State, Eastern Cape and Lesotho. Songs of African Rock Pipits at both Tswalu and Groblershoop were found to be more tri-syllabic, starting with the typical whistle-like first syllable, then proceeding into a trilling "*treeeu"* and ending with a last "*trrru*" note. However, some males uttered up to three different song variations in a single singing bout. In addition to the usual song phrase, a downward trilling vocalization (without the initial introductory whistle) "*prreeeeuuuu*" has been heard at both the Tswalu and Groblershoop study sites.

In summary

My study so far shows that the song differences between different African Rock Pipit populations may be attributed to the isolation of populations of this species on hilly areas separated by unsuitable plains habitat (see de Swardt 2010). This is a remarkably adaptable species, with western birds occurring in semi-arid karroid shrub on barren hills, while in the eastern parts of its range this pipit inhabits mesic, temperate alpine grasslands. Data from the *Southern African Bird Atlas Project* suggest a zone of lower abundance in the distribution range, from Aliwal North in the Eastern Cape towards towards Smithfield in the Free State and eastwards to Wepener and Lesotho areas (moist grassland) and this distributional pattern was also confirmed by analysis of song recordings obtained in various parts of the Free State and adjacent Lesotho. The Groblershoop populations along the Skurwe Mountain range are separated by about 100 kilometres from those on Tswalu's Korannaberg, and a further 280 kilometres towards the western Free State east of Kimberley. Preliminary statistical analysis on the song structures of ARP suggests that the ARP's of the Northern Cape possibly evolved to a separate, unique form.

Figure 5 - *African Rock Pipit habitat at Prynnsberg in the Groblershoop area. Note the grass tufts on the rocky surface and more rocky areas at higher parts of the slope.*

In order to study the inter-population relationships of the Northern Cape ARP's, blood samples were collected from a bird ringed at Picnic Valley, Tswalu Kalahari Reserve and additional genetic

material was collected from an individual caught at Prynnsberg, Groblershoop. Biometric data collected from these birds and plumage characteristic were found not to differ from birds at other populations in its distribution range. A DNA study is in progress to determine whether these isolated ARP populations differ from the remainder of the population. Future research on this species is therefore needed to determine how the evolutionary process in ARP evolved and how the ARP of the Northern Cape was becoming isolated from the other populations in their distributional range. As it is also stated in the *2015 Red data Book of Birds,* a study is also required to determine the population sizes of ARP in these isolated localities and to determine whether the Northern Cape's "island-populations" face the same extinction risks as have proved detrimental to so many taxa endemic to oceanic islands. The ARP may also prove to be an indicator species for the ecological health of its specialised and restricted habitat, which is home to a range of other restricted fauna and flora.

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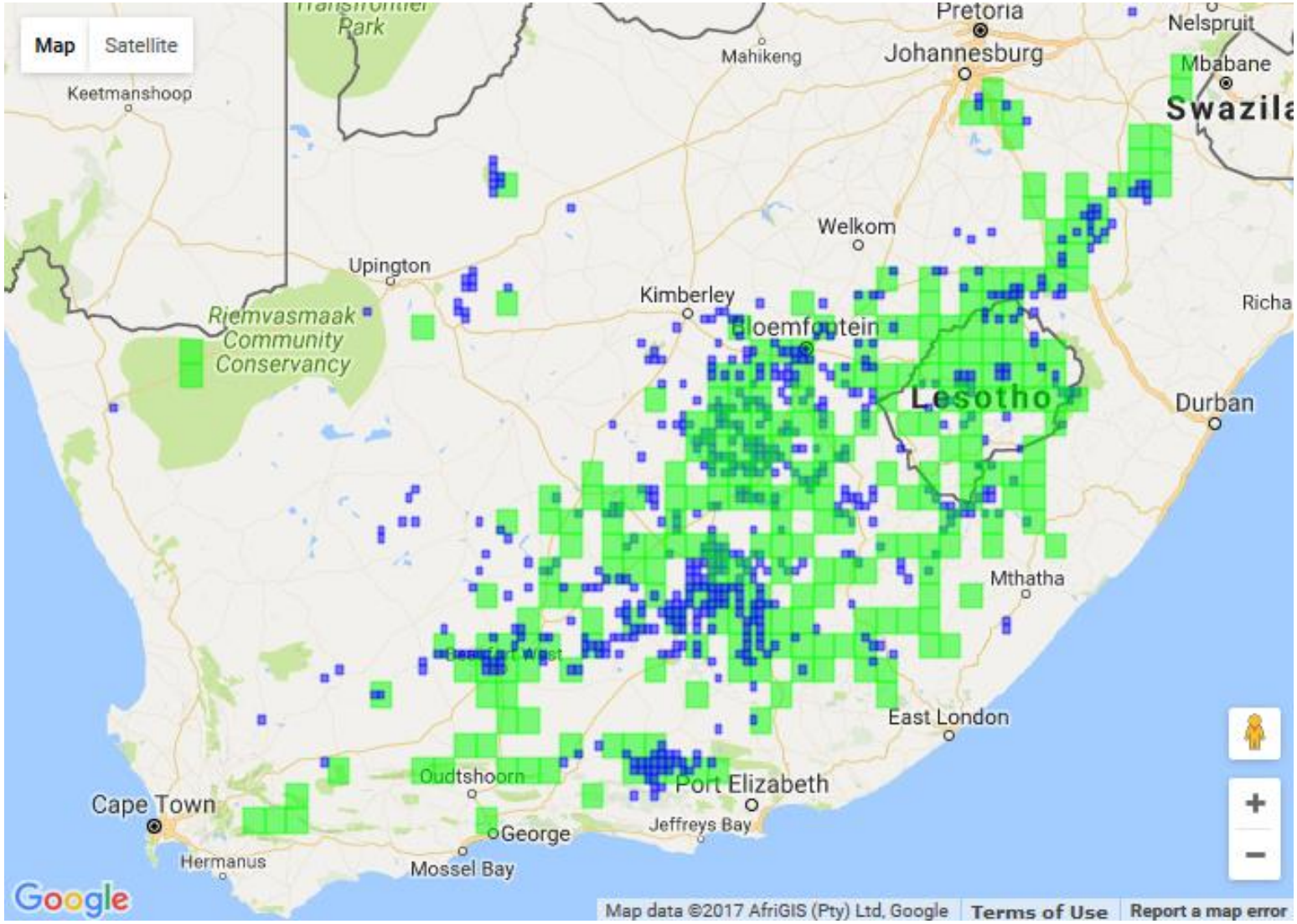

Appendix 1 *– Distribution map for the African Rock Pipit, showing SABAP1 records (large green grids) and SABAP2 grids (smaller blue grids).*