Conserving the Endangered Botha’s Lark (*Spizocorys fringillaris*) and its threatened grassland habitat

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1 Introduction

Botha’s Lark (*Spizocorys fringillaris*) are uncommon birds, and numbers have reportedly decreased by at least 30% over the last three generations. The population is currently estimated at less than 2,500 mature individuals, and is thought to have undergone a rapid decline from some 20,000 mature individuals in the early 1980s (Taylor, 2015). Today, Botha’s Lark is classified as Endangered by IUCN and given its rapid decline, conservation work is urgently required for this species. To date very little research, or conservation work, has been conducted on Botha’s Lark. Consequently, there are many gaps in our knowledge about this species’ biology and conservation needs. The only existing information we have had to date is from ad hoc sightings and localized surveys by keen birders. All of the recent literature, especially the latest Red List evaluation by Taylor (2015), stresses the importance of urgent research and conservation work for Botha’s Lark. With the funding provided by African Bird Club to our organization (the Endangered Wildlife Trust, the EWT), we were able to successfully focus on the species’ conservation needs, as mentioned above.

2 Project update

The EWT’s Threatened Grassland Species Programme (TGSP) aims to conserve the Endangered Botha’s Lark and its threatened grassland habitat. In the past 11 months, the current Area of Occupancy (AOO) of Botha’s Lark was researched, as the current estimate is based on very limited and largely unsubstantiated data. Farms around the towns of Amersfoort and Wakkerstroom (both in the Mpumalanga Province of South Africa) have been assessed for Botha’s Lark populations based on sighting records that date back to 2003. Unfortunately, Botha’s Lark were not observed. Botha’s Lark populations were found on only eight farm portions of the twenty-six (26) farms visited. These were located around Amersfoort (nine), Wakkerstroom (twelve), and five farms between Amersfoort and Ermelo (5). The areas in which Botha’s Lark were observed did not present high numbers of the species, and these numbers are predicted to decline even further due to ongoing threats (such as increased ploughed fields for maize production) in the surrounding areas.

Of the areas researched, many farms that were previously reported to have Botha’s Lark no longer have signs of the species (due to threats discussed later in this report). However, a site assessment of the communal farm Daggakraal (outside Amersfoort) indicated that this farm appears to be a stronghold of Botha’s Lark, where previously there were very few sightings recorded. All new sightings and recordings have been updated into the species database to contribute to the niche model of the species.

Areas in other provinces that had the potential to support Botha’s Lark were also assessed. These have been researched in order to assist in generating an ecological niche model (See Section 2) to contribute to our understanding of the Extent of Occurrence (EOO) and potential new Area of Occupancy (AOO). The ecological niche model that has been generated so far has provided better insight of potential AOO.

Farms in the Free State Province have been assessed for Botha’s Lark, and an area between the Free State towns of Harrismith and Verkykerskop has been identified as a species stronghold.
With this understanding of the species’ EOO and AOO, coupled with our frequent site visits to these areas, a better understanding on the status of the species and its threats has been obtained.

The concept of Biodiversity Stewardship has been introduced to landowners in the areas in which Botha’s Lark strongholds were found. The South African National Biodiversity Institute (SANBI, 2014a) defines Biodiversity Stewardship as an approach to entering into agreements with private and communal landowners to protect and manage land in biodiversity priority areas, led by conservation authorities in South Africa. It recognizes landowners as the custodians of biodiversity on their land. The types of Biodiversity Stewardship agreements to be explored with private landowners will be formally declared protected areas in terms of the National Environmental Management: Protected Areas Act, 2003 (Act no. 57 of 2003) or NEM: PAA, providing long-term security for the sites involved.

Figure 1: EWT Field officer Mauritz de Bruin and Mpumalanga Tourism and Parks Agency (MTPA) ecologists identify Botha’s Lark on a farm outside Amersfoort (Mpumalanga)
Figure 2: A Botha’s Lark photographed on an overgrazed farm patch outside Verkykerskop.

Figure 3: A rare photo of a Botha’s Lark feeding outside Harrismith (photo credit: Hugh Chittenden).
3 Activities completed

3.1 Update (largely unsubstantiated) population estimates and survey to identify current AOO of Botha’s Lark

During the past 6 months, South Africa’s highland grasslands have been surveyed for the endemic Botha’s Lark. Through extensive fieldwork and a literature search on existing data of the species, a dataset was produced which gave us a clear understanding of the current AOO. Allan et al. (1983) estimated a total global Botha’s Lark population of 1,000 to 20,000 birds, which was later revised by Siegfried (1992) to 1,500 – 5,000 individuals (BirdLife International, 2016). Unfortunately, the updated AOO confirmed Peacock’s hypothesis (2015) that there are estimated to only be approximately 2,500 mature individuals left, and this number is declining.

In many areas in which Botha’s Lark have been recorded before (by keen birders), no sightings were made in the past year, suggesting that the species do not occur in these areas anymore. In addition, Botha’s Lark have a strong resemblance to the common Spizocorys conirostris (Pink-billed Lark), which occurs in similar areas. After intense surveys during the past 6 months, we have noted that in many areas in which people have claimed to have seen Botha’s Lark, the birds had been mistaken for Pink-billed Lark. On a positive note, we have discovered some new areas at which sightings had not yet been recorded. The possibility exists that the populations could have moved due to climate change, however it is more likely that birds have moved due to transformation or disturbance of habitat.

3.2 Generate an ecological niche model to contribute to our understanding of the EOO and potential new AOO

MaxEnt software (Phillips et al., 2006) was used to model the Botha’s Lark’s niches and distributions. This software is based on the maximum-entropy approach that uses a set of environmental (e.g. geology, rainfall) layers and georeferenced occurrence localities (all recorded sightings), to express a probability distribution and a predicted suitability of conditions for the species. Fifty-seven (57) recorded sightings (verified by our own EWT team) of Botha’s Lark were logged into the software with the appropriate environmental layers for the species localities (rainfall, temperature, vegetation, climate, geology, elevation, slope, and cattle density). The software produced a model (Figure 4 and Figure 5) that presents the current distribution of the species as well as probability predictions of suitable habitat for Botha’s Lark.
Figure 4: A representation of the MaxEnt model for the distribution of Botha’s Lark. Warmer colors show areas with better predicted conditions. White dots show the presence locations used for training, while violet dots show test locations.

Figure 5: Magnified view of Figure 4 illustrating the small size of the predicted Botha’s Lark habitat. The areas circled in red are proposed to be declared a Protected Environment (see section 3, Figure 10)
The following figure illustrates the receiver operating characteristic (ROC) curve for the above data, i.e. an illustration of how accurate the model is. The maximum achievable area under curve (AUC) is less than 1 (Phillips et al., 2006), this means the closer the training data (Botha’s Lark predictions illustrated above) curve is to one (1), the more accurate your model is. With the training data producing a value of AUC=0.997 (Figure 6), it shows that the model illustrated above is very accurate.

![ROC Curve](image)

*Figure 6: Sensitivity vs. 1 – Specificity for Botha’s Lark. AUC = 0.997, meaning the model is extremely accurate*

### 3.3 Increase landowner awareness for effective management of Botha’s Lark habitat

#### 3.3.1 Designate areas to be managed for this species

Less than 1% of the global population of Botha’s Lark is currently located within protected areas (Evans, 1999). The species is likely to continue to decline unless the strongholds are placed under formal protection. With the successes of our team’s project, Botha’s Lark strongholds are, for the first time, being included in the process for proclamation of a Protected Environment (PE) under the South African NEM: PAA, as mentioned above.

In the last few months, 15,744 ha of land, supporting one of the largest and most important strongholds of Botha’s Lark were identified (also identified by Peacock, 2015). These have been presented to the provincial authority, Mpumalanga Tourism and Parks Agency (MTPA) and will form part of our proposed Phase 1 protected areas (Figure 7, Figure 8). The proposed areas have been approved, and await final signature from the provincial minister to be declared as a Protected Environment. All of the landowners
whose properties fall under Phase 1 must agree to adhere to sustainable land use practices as part of the management plan that will be assigned to them. Phase 2 of this project will focus on areas which will allow us to expand the areas of protection of Botha’s Lark in future.

The farms that support Botha’s Lark strongholds between Harrismith and Verkykyerskop in the Free State province are our next target for Protected Environment declaration (Figure 9). These farms are also listed as Important Bird and Biodiversity Areas (IBAs) by BirdLife South Africa, as the farms support many other Threatened and Endangered bird species, such as *Balearica regulorum* Grey Crowned-crane (Endangered), *Anthropoides paradiseus* Blue Crane (Vulnerable), *Anthus Chloris* Yellow-breasted Pipit (Vulnerable), *Gyps coprotheres* Cape Vulture (Endangered), *Geronticus calvus* Southern Bald Ibis (Vulnerable), *Anthus petrosus* Rock Pipit (Least Concern), and many other species. A meeting was held with the provincial authority for the Free State, the Department of Economic, Small Business Development, Tourism and Environmental Affairs (DESTEA), in order to propose the farms that support Botha’s Lark strongholds for proclamation. Currently, the extent of the area to be included in the Protected Environment (PE) is being determined through frequent site assessments and farmer engagement.

![Figure 7](image_url)

*Figure 7: The areas around Wakkerstroom (Mpumalanga) that are in the process of being proclaimed as a Protected Environment*
Figure 8: Map showing high priority areas within the proposed Wakkerstroom Phase 1 Protected Environment

Figure 9: The areas between Harrismith and Verkykerskop (Free State) that are proposed for proclamation as a Protected Environment
Figure 10: A map illustrating the two areas that support Botha’s Lark strongholds (as seen in Figure 5) in Mpumalanga and the Free State that are in the process of being declared as Protected Environments.

With additional funding from other sources, we are hoping to be able to formally have proclaimed more than two thirds of the currently known areas of Botha’s Lark strongholds, and ultimately halt the current decline the species has faced in the last few decades.

3.3.2 Raise awareness of and involve owners in non-detrimental management practices

Much of our team’s time has been dedicated to engaging with farmers in the focus areas and explaining to them the importance of conserving Botha’s Lark, as well as other relevant species. We focus on sustainable grassland practices, explaining to the farmers how fire and grazing are the most influential factors in managing their grasslands for both production and biodiversity. Any change in fire and grazing regimes that supports more resilient grassland ecosystems will better support livelihoods. Many presentations have also been given to local community members and farmers about the importance of sustainable land use practices (Figure 11, Figure 12).
Figure 11: The EWT team attended a young farmers’ conference in Midrand, Gauteng. Posters on grassland species (including Botha’s Lark) were handed out, and guidelines for managing grasslands in a sustainable manner were discussed.

Figure 12: Field officer Mauritz de Bruin doing a presentation at a farmers’ union meeting in Devon, on the importance of species in grasslands and how to manage these effectively.
3.4 Identify and confirm factors contributing to population declines in order to promote better management

3.4.1 Factors contributing to population decline

As is the case with most other threatened grassland species, habitat destruction and modification through agriculture, mining, and urban expansion are the principal threats faced by Botha’s Lark. Increased fragmentation of this species’ remaining habitat, coupled with its increasingly patchy occurrence with minimal contact between sub-populations, is of major concern. The past year has presented many threats to the intact grasslands in which Botha’s Lark occurs. Open cast coal mines (Figure 13) and agricultural transformation (Figure 14) were the biggest threat to the species this past year. However, the late burning of grassland due to a major drought also presented some issues, as this may shorten the potential breeding season and force a peak in breeding that coincides with high predator numbers (which has also been suggested by Maphisa et al. 2009), although more research on this is required. As mentioned above, a recent shift in AOO (moving northwards) has been noted, which may be linked to climate change. All of these threats highlight the necessity to advocate better management and conservation practices, which is why we put extra effort into promoting sustainable land use practices (as mentioned above).

Figure 13: An area of intact grasslands that has been completely transformed by a coal mine. The area borders on a Botha’s lark stronghold
3.4.2 Identify potential mitigation measures and develop an abbreviated conservation plan

The areas that have been proposed for proclamation as protected areas will be assigned a management plan for the next five years. This management plan is set on the recommendations of the provincial government’s ecologists and the EWT team, and will aim to preserve the current habitat and mitigate areas that have been degraded, whilst still encouraging productivity and economic gain for the farmers.

Educational material related to grassland management through sustainable grazing and fire management was used during community and farmer engagements. This educational resource was developed using a participatory process as part of a community engagement facilitation process on grassland management issues. The management plans discussed with communities were based on the South African National Biodiversity Institute’s (SANBI’s) guidelines for grazing and burning guidelines (2014b) which are focused on managing grasslands for biodiversity and livestock production.

4 Conclusion

The landowners of the areas that support Botha’s Lark (which have been selected and assessed for proclamation as part of Phase 1) have been consulted to discuss sustainable land use practices that will ensure the security of Botha’s Lark strongholds. Depending on available funds, the next step will be to monitor these practices on a long-term basis, and monitor the status of the species.
5 References


