Target Species Project
Feedback Report

Nuwejaars Wetlands Special Management Area

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Preamble

The Overberg comprises an array of natural habitats situated in a mosaic of agricultural lands (Figure 1). The region stretches across 12 241 square kilometres from the Hottentots-Holland mountains in the west to the Breede River mouth in the east, up to the Riviersonderend Mountains in the north and down to the Agulhas Plain and the southernmost tip of Africa. The Agulhas Plain, an internationally recognised biodiversity hotspot, encompasses the south-western coastal lowlands fynbos ecosystems and is home to the complex Agulhas Plain-Heuningnes Estuary wetland system, which is recognised by BirdLife South Africa (BLSA) as an Important Bird and Biodiversity Area (IBA). According to the IBA 2016 publication 'It is one of the most important wetland systems in South Africa in terms of vegetation diversity, and variety of seasonal and permanent wetlands'. The region and its diverse habitat is home to many specialist, threatened bird species, however agricultural activities have transformed and fragmented much of the natural functioning ecosystems into a matrix of monoculture cereal harvests. The patches of natural habitat that remain are very small and isolated, and are in constant threat of becoming more reduced or even lost all together by; alien invasive species encroachment, uncontrolled fires, overgrazing and mismanagement because their significance in this ecosystem is not understood.

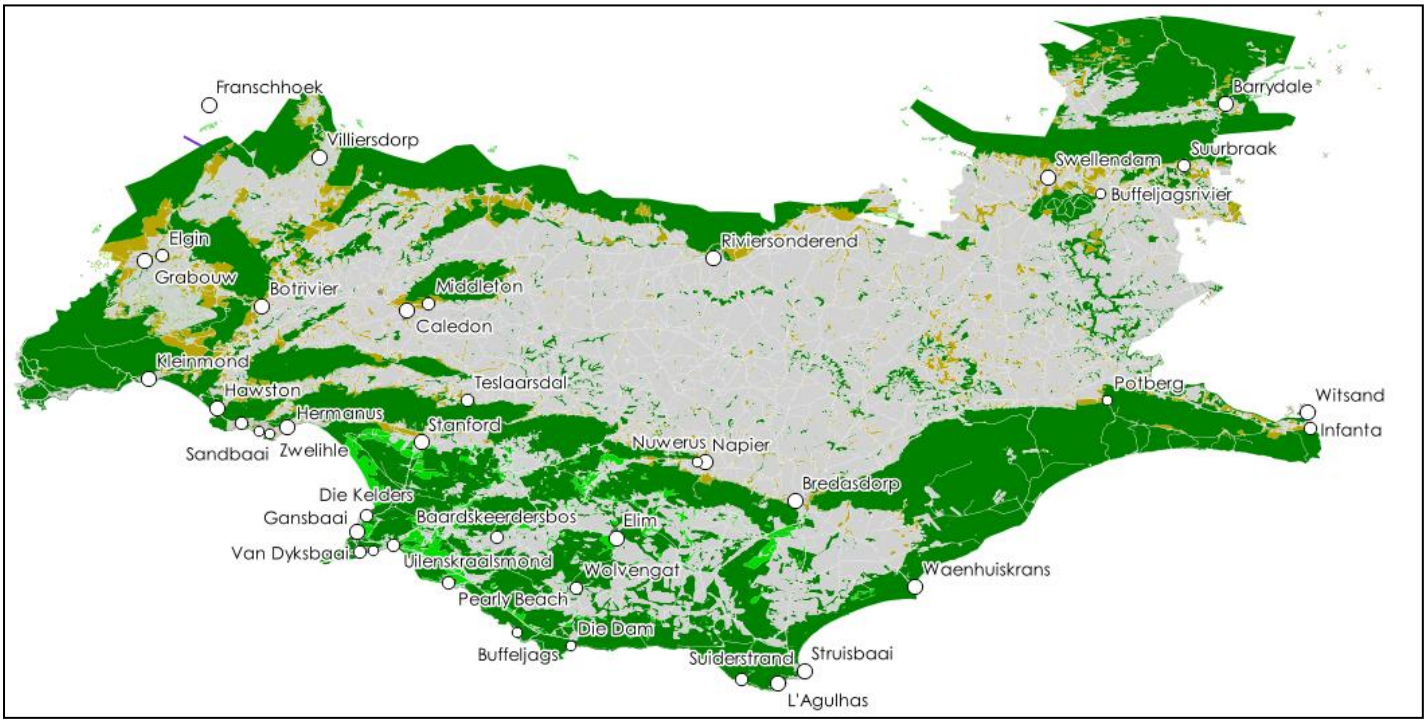


Figure 1. A map of the Overberg displaying the transformed (agricultural lands) in grey and the natural vegetation extent in green.

With the loss of integral functioning habitat follows the loss of species, specifically threatened specialist avian species which are reliant on healthy ecosystems for roosting, breeding and foraging. According to CapeNature's Western Cape State of Biodiversity Report 2017, there are two critically endangered, 11 endangered, 15 vulnerable and 19 near threatened birds at a regional scale within the Western Province. The elusive Hottentot Buttonquail, *Turnix hottentottus*, is a range-restricted fynbos endemic. Very little is known about this species distribution and population size, and its South African Bird Atalssing Project 2 (SABAP2) distribution is one of the sparsest of any of South Africa's terrestrial bird species. The Black Harrier, *Circus maurus*, with its core distribution located within the Fynbos Biome, is one of the most range restricted harrier species in the world. With less than 1000 mature individuals left in the region, this species is classified as near threatened. The Southern Black Korhaan, *Afrotus afra*, classified as vulnerable is endemic to the region and generally scarce and localised with an unknown population size which requires urgent investigation. Core breeding habitats for these species, and a plethora of others have been extensively transformed and minimised by the establishment of the wheat belt in the Overberg within the last century (Taylor et al, 2015; Wright and Lee, 2017; Turner, 2017).

Understanding where these bird species are distributed in the landscape is pivotal to introducing conservation measures to protect them. Fortunately through collaboration, a group of conservation

organisations within the Overberg, being the Overberg Crane Group (OCG), Birdlife SA (BLSA), the Overberg Renosterveld Conservation Trust and the Nuwejaars Wetlands Special Management Area, has developed and these groups are working together under both formal and informal agreements to protect and restore our natural capital in all its forms, with birds and their habitats a prime focus.

Project Aim

The main objective of the project was to monitor and capture distribution data for the bird species within the Heuningnes-Agulhas Plain Important Bird and Biodiversity Area (IBA)(Figure 2) and develop an avian sighting database focusing on selected specialist, threatened and endemic bird species (known as 'Target Species'). The project was spearheaded by the Nuwejaars Wetlands Special Management Area (NWSMA) with the Overberg Crane Group (OCG) acting as the strategic partner, and hosting the resulting database. In total 26 birds from the Heuningnes-Agulhas Plain IBA threatened bird list, as well as range restricted birds and species of special interest to the NWSMA were identified for the 'Target List' (table one). The resultant database will be a valuable threatened species record, which can be utilised to analyse short and long term trends pertaining to population demography and avian habitat preference, a key requirement for developing conservation action projects. As a sub objective of the project, the NWSMA will focus its efforts on analysing trend data and identifying 'hotspots' for Southern Black Korhaan, *Afrotus afra*, (SBK) within the Agulhas Plain-Heuningnes IBA.

African Oystercatcher, *Haematopus moquini*	Cape Eagle-owl, *Bubo capensis*	Karoo Korhaan, *Eupodotis vigorsii*
African Grass Owl, *Tyto capensis*	Cape Spurfowl, *Pternistis capensis*	Lanner Falcon, *Falco biarmicus*
African Marsh-harrier, *Circus ranivorus*	Caspian Tern, *Hydroprogne caspia*	Lesser Flamingo, *Phoeniconaias minor*
Agulhas long-billed lark, *Certhilauda brevirostris*	Chestnut-banded Plover, *Charadrius pallidus*	Martial Eagle, *Polemaetus bellicosus*
Black Harrier, *Circus maurus*	Damara Tern, *Sterna balaenarum*	Marsh Owl, *Asio capensis*
Blue Crane, *Anthropoides paradiseus*	Denhams Bustard, *Neotis denhami*	Secretary bird, *Sagittarius serpentarius*
Cape Bulbul, *Pycnonotus capensis*	Greater Flamingo, *Phoenicopterus roseus*	Southern Black Korhaan, *Afrotis afra*
Cape Clapper Lark, *Mirafra apiata*	Greater Painted-snipe, *Rostratula benghalensis*	Striped Flufftail, *Sarothrura affinis*
Cape Cormorant, *Phalacrocorax capensis*	Hottentot Buttonquail, *Turnix hottentottus*	

Table 1. List of the 26 Target species

Data collection methods

Threatened species data base

Monitoring data (sightings of birds) are recorded using the existing South African Bird Atlas Project 2's model. The SABAP2 plays a vital role in providing distribution and abundance data of bird species within South Africa and it is defined as a 'citizen science project driven by volunteers who map the distribution of birds across several southern African countries'. To gather data (called atlassing), volunteers select a geographical 'pentad' (Figure 2) on a map and record all the bird species seen within a set time frame, in order of species seen. The mobile phone app Birdlasser is used to log all sightings. This information is uploaded to the SABAP2 database, and all data we have submitted is extracted and sent to us. In order to maximise data collection for the target species database, we employed the following data collection methods:

1.1 NWSMA atlasses pentads that are both feasible and viable within the Heuningnes-Agulhas Plain IBA (Figure 2). All bird species sighted are recorded, with a focus on searching for listed Target Species.
1.2 NWSMA captures all ad-hoc sightings of Target Species whilst performing normal operational duties within the IBA.

1.3 Develops (with BirdLife South Africa and the OCG) the 'Overberg Challenge' on Birdlasser, allowing access to sightings recorded by citizen scientists across the greater Overberg.

Specific focus on Southern Black Korhaan

We have undertaken specific work to better understand the Southern Black Korhaan numbers and threats. Our work includes:

2.1 Analysis of historic raw data of the University of Cape Town's Animal Demography Unit for Southern Black Korhaan sightings during the Coordinated Avian Road Count (CAR) between 1997 and 2017 for all the CAR routes.

2.2 Combining results of threatened species database SBK sightings and historic raw data from the BLSA's 'threatened species Birdlasser cause' for Heuningnes-Agulhas Plain IBA (January 2016 to July 2018).

2.3 Map distribution and identify 'hotspots' of SBK within the Heuningnes-Agulhas Plain IBA.

Results

Threatened species database

Atlassing pentads

The Nuwejaars Wetlands Special Management Area's Conservation Managers atlassed 26 pentads within the Heuningnes Agulhas-Plain Important Bird and Biodiversity Area between October 2017 and January 2019, approximately 1.7 pentads per month (Figure 2). In the region of 1 600 km and 80 hours were spent atlassing pentads. In total, 1 184 sightings were logged and added to the database, and of this 150 were of the listed target species. A total of 161 avian species were sighted, however only 15 of the 26 target species were recorded whilst atlasing.

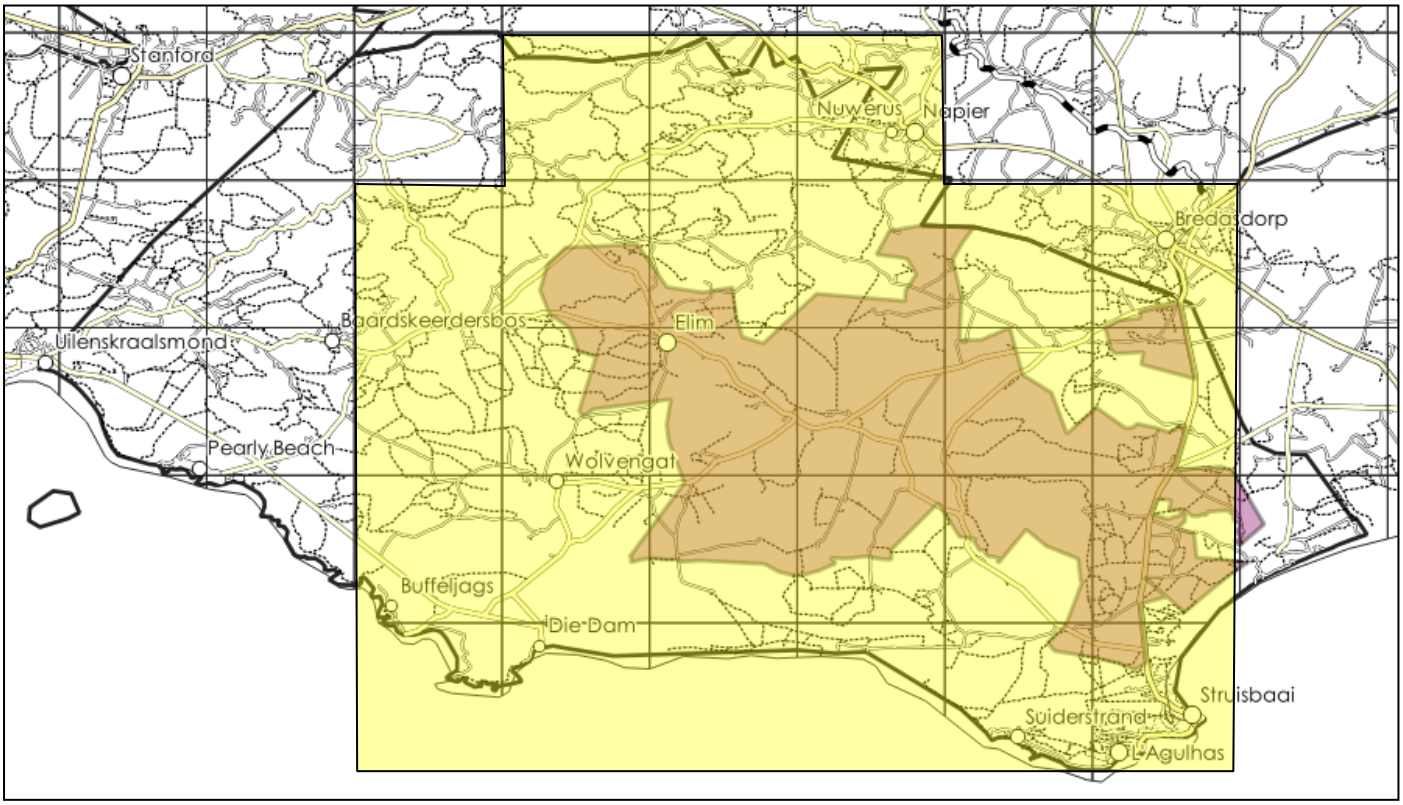


Figure 2. Map showing the Nuwejaars Wetlands Special Management Area's boundaries (purple), within the Agulhas Plain-Heuningnes IBA (thick black outline), over laid with SABAP2's pentads grid system (black squares). The yellow squares show the pentads which were atlassed during the project.

Ad-hoc sightings

The Nuwejaars Management team captured 2 366 sightings of birds within the IBA , with 202 bird species being recorded for the 2017/2018 period. Of the 2 366 sightings, 371 were of 20 of the listed target species, leaving African Grass-owl, Marsh Owl, Cape Eagle-owl, Damara Tern, Karoo Korhaan and Greater Painted-Snipe unseen by the management team.

In total, full protocol and ad-hoc sightings from the Nuwejaars Wetlands Special Management Area resulted in a staggering 3 550 sightings logged (Table 2) via Birdlasser, which contributes to the existing SABAP2 database (Figure 3). Overall ad-hoc, on-the-job monitoring yielded more total bird sightings, target sightings and overall species sightings than atlassing full protocol pentads (Table 2.)

	Full Protocol Pentads	**Ad-Hoc Sightings**
Total bird sightings	1184	2366
Total species	161	202
Total target species sightings	150	371
Total target species	15	20

Table 2. Shows the sightings achieved by the Nuwejaars Wetlands Special Management Area Conservation Team.

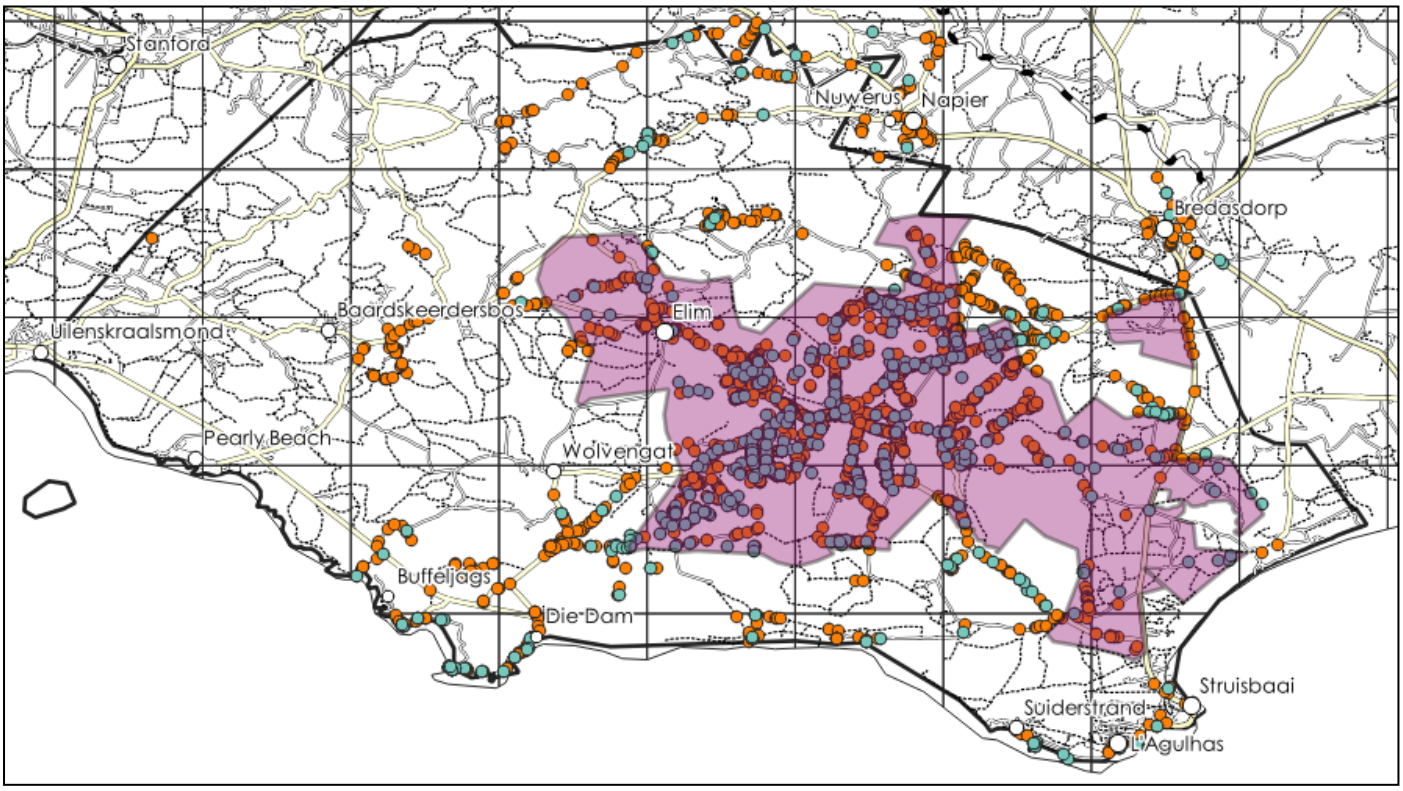


Figure 3. Map showing the Nuwejaars Wetlands Special Management Area's boundaries (purple), within the Agulhas Plain-Heuningnes IBA (thick black outline), overlaid with SABAP2's pentads grid system (black squares). The orange dots represent all bird sightings by the Nuwejaars team, and the blue dots represent target species sightings

Overberg Challenge

In order to accumulate additional sightings the NWSMA collaborated with the Overberg Crane Group, BirdLife South Africa and Birdlasser to develop the 'Overberg Birdlasser Challenge'. Utilising the 'challenge function' of Birdlasser provides access to a larger data pool, and citizen scientists who joined the challenge provided monitoring and occurrence data for target species and contributed to the threatened bird database. The challenge area was extended and set within a 150 km radius from the Southernmost Tip of Africa at Agulhas (DDS -34.83315278, DDE 19.999775), and included five Important Bird and Biodiversity Areas (Figure 4). The Overberg 150 km challenge had over 40 participants joining and sharing data between January 2017 and December 2018. A total of 29 047 sightings were logged, with a staggering 329 bird species recorded. Over the two year period, 2 554 sightings were captured of the listed target species (Figure 4). Marsh Owl was the only species on the target list that was not recorded.

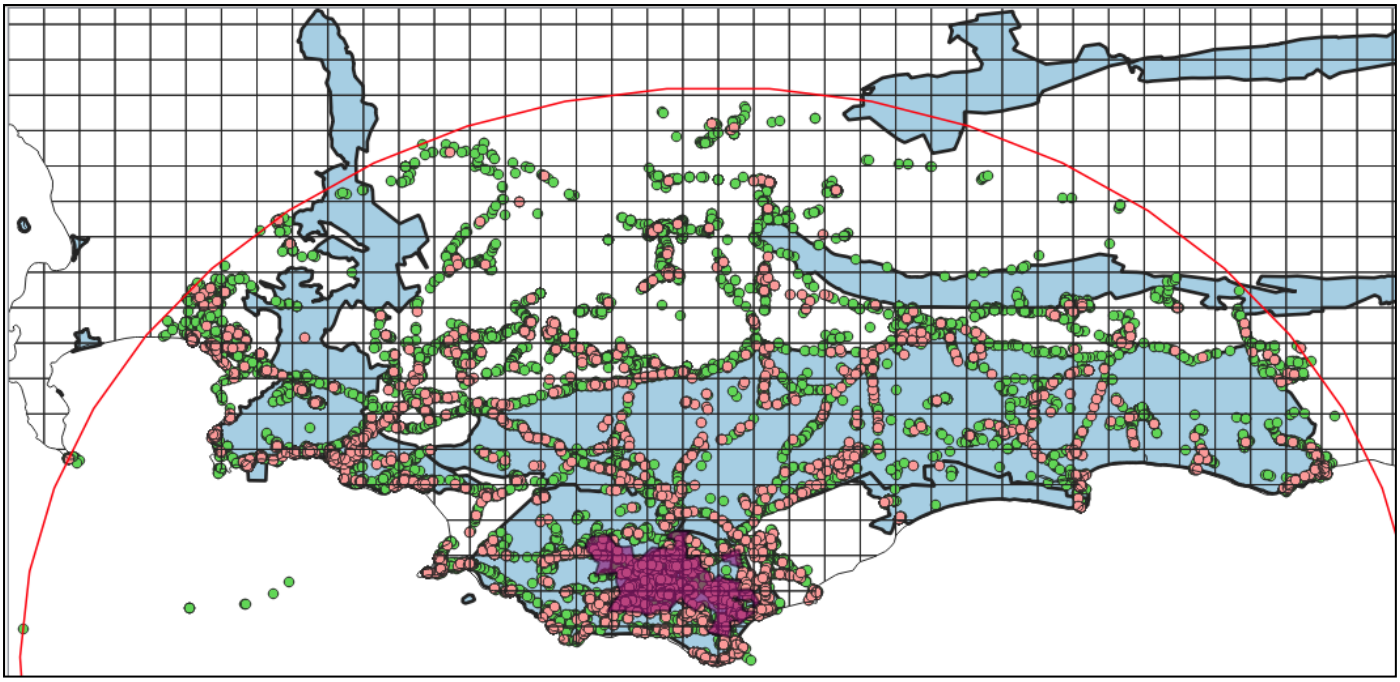


Figure 4. Map showing all the bird species logged (green dots) and highlighting the target species (pink dots) per pentad (grid block lines) for the Overberg Challenge. The Overberg challenge radius area (highlighted in red) includes the five IBA's (light blue) and the Nuwejaars Wetlands Special Management Area (in purple).

Focusing on the Southern Black Korhaan

CAR Data

The Southern Black Korhaan population is suspected to have declined by up to 30% in percentage range change (area of occupancy) over the past three generations (Taylor et al, 2015). Similar findings were evident in Hoffmann's (2012) PhD thesis, based on Coordinated Avifaunal Roadcounts (CAR) and SABAP data. In order to ascertain if this trend continued, we derived long term raw CAR data from the University of Cape Town's Animal Demography Unit (ADU) for Southern Black Korhaan sightings in the Overberg. A rudimentary analysis of SBK density between 1997 and 2017 showed a steady decline in population numbers over the 20 year period across the Overberg (Figure 5).

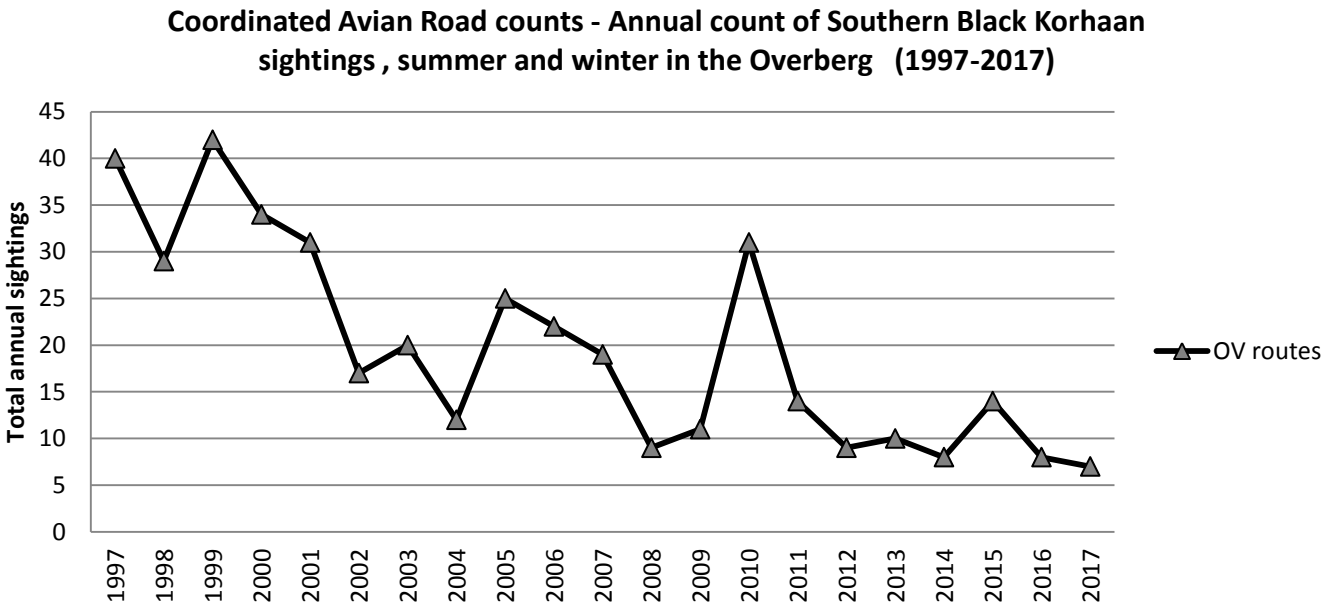


Figure 5. Annual total sightings of Southern Black Korhaan along the CAR Routes.

Southern Black Korhaan prefers fynbos, renosterveld and the succulent Karoo as habitat (Chittenden et al. 2017). Capturing CAR data involves classifying the habitat type linked to species sightings. In our analysis we classified the 49 habitat types into three categories in order to simplify the data. Veld and wetland habitat types were classified as Natural, and were presumably represented by fynbos or renosterveld. All other

habitat types were classified as transformed, these were largely associated with different types of agricultural lands and roads, namely crop types, pasture, fallow land, ploughed land etc. Sightings which did not record the habitat type were classified as indeterminate (Table 3). Over the 20 year monitoring period 336 sightings of Southern Black Korhaan were recorded. Only 31% of the sightings were found in natural habitat and the majority were recorded in a transformed habitat (52%).

Habitat category	Quantity of sightings
Natural	107
Transformed	173
Indeterminate	56

Table 3. Comparative data showing habitat types of Southern Black Korhaan records for all CAR Overberg routes.

Birdlasser atlassed data

In order to collate as much data as possible on the Southern Black Korhaan distribution across the Overberg, we derived historic data of sightings logged by citizen scientists within the Heuningnes-Agulhas Plain IBA and the Overberg Wheat belt IBA through Birdlasser from the last 30 months (January 2016 to July 2018). We then combined this with the Southern Black Korhaan population data captured by Nuwejaars Wetlands SMA staff and the Overberg Challenge for the threatened species database. The database holds 260 Southern Black Korhaan sightings with corresponding GPS coordinates (Table 4 & Figure 6).

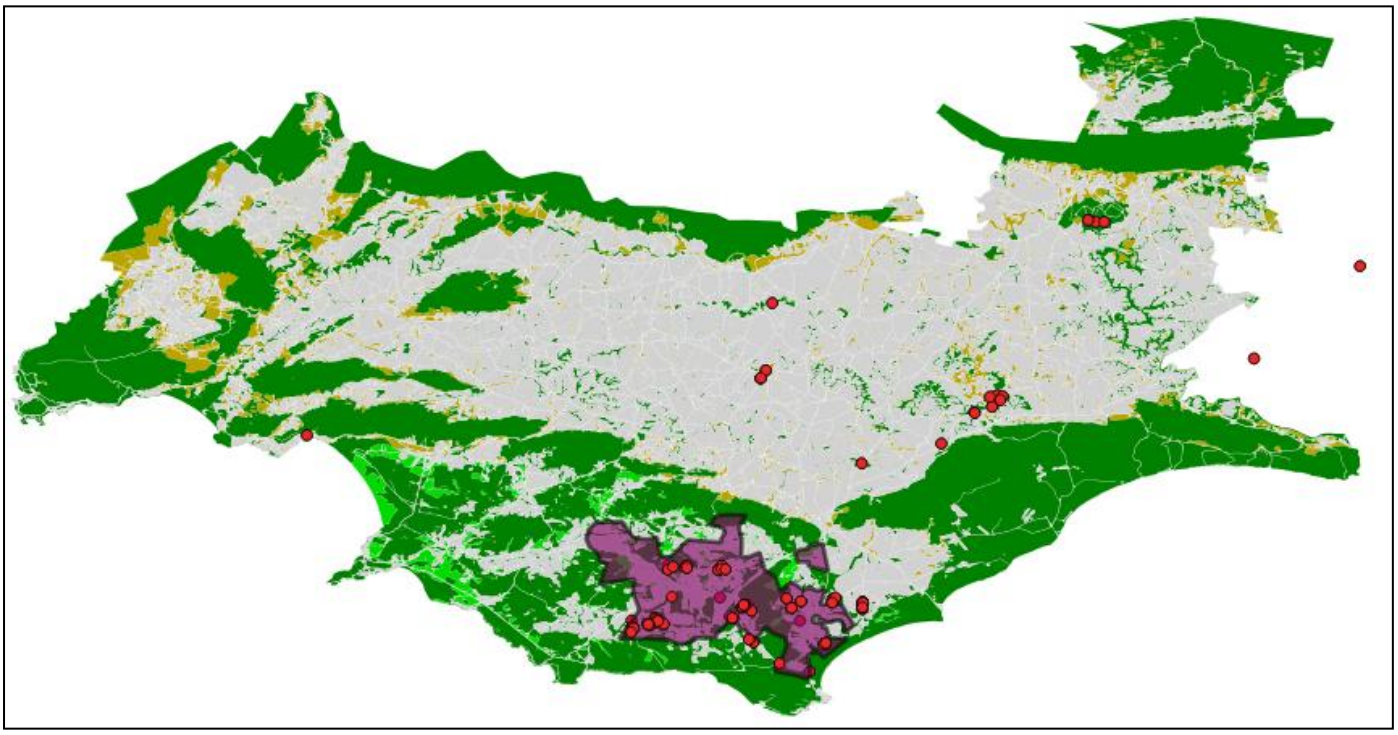


Figure 6. Southern Black Korhaan sightings (red dots) found within the transformed, agricultural lands (grey layer) and natural vegetation (green layer) Overberg context. Map also highlights the Nuwejaars Wetlands SMA boundary (in purple).

Source	Duration	Qty.
NWSMA full protocol pentads	October 2017 – January 2019	1
NWSMA Ad hoc sightings	August 2017 – January 2019	31
Overberg Challenge Data	January 2017 – December 2018	73
Birdlasser 'threatened species cause 'Overberg Wheat Belt IBA	January 2016 – July 2018	54
Biirdlasser 'threatened species cause' for Heuningnes-Agulhas Plain IBA	January 2016 – July 2018	101

Table 4. Comparative data of quantity of Southern Black Korhaan sightings within the Overberg from various sources

When Critical Biodiversity Areas (CBA) and habitat condition maps are overlaid with Southern Black Korhaan sightings, the results show that many of the sightings are found in 'No Natural' and 'Degraded' areas, namely transformed agricultural lands. It is also quite evident that the majority of the sightings from

the collective database were found within the boundaries of the NWSMA. Of the sightings found outside of the Nuwejaars boundary (n=22), 75% were recorded on transformed habitat, and only 25% in natural vegetation (Figure 7). These findings are similar to those within the boundaries of the NWSMA. As these birds are cryptic and quite secretive it is possible that that they are more readily seen in transformed areas than in natural ones.

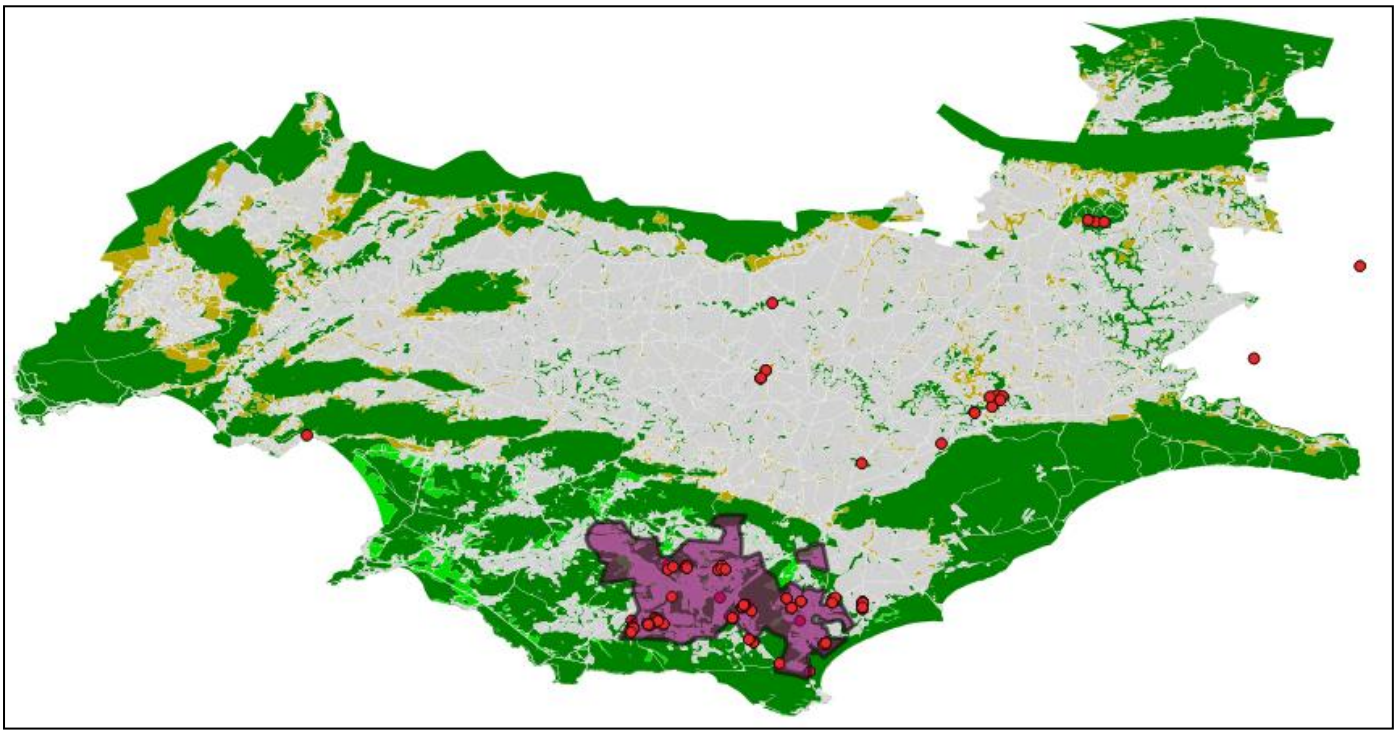


Figure 6. Southern Black Korhaan sightings (red dots) found within the transformed, agricultural lands (grey layer) and natural vegetation (green layer) Overberg context. Map also highlights the Nuwejaars Wetlands SMA boundary (in purple).

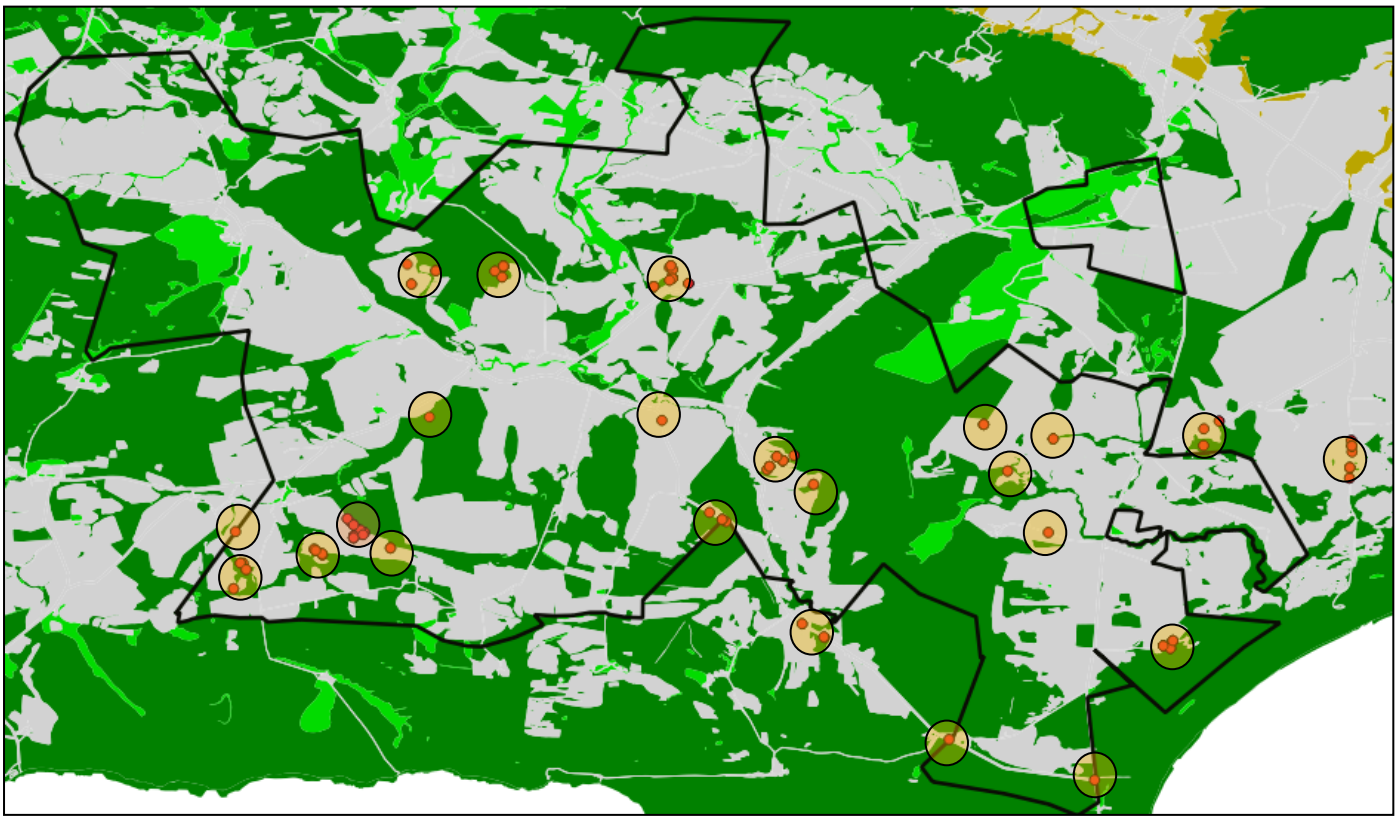
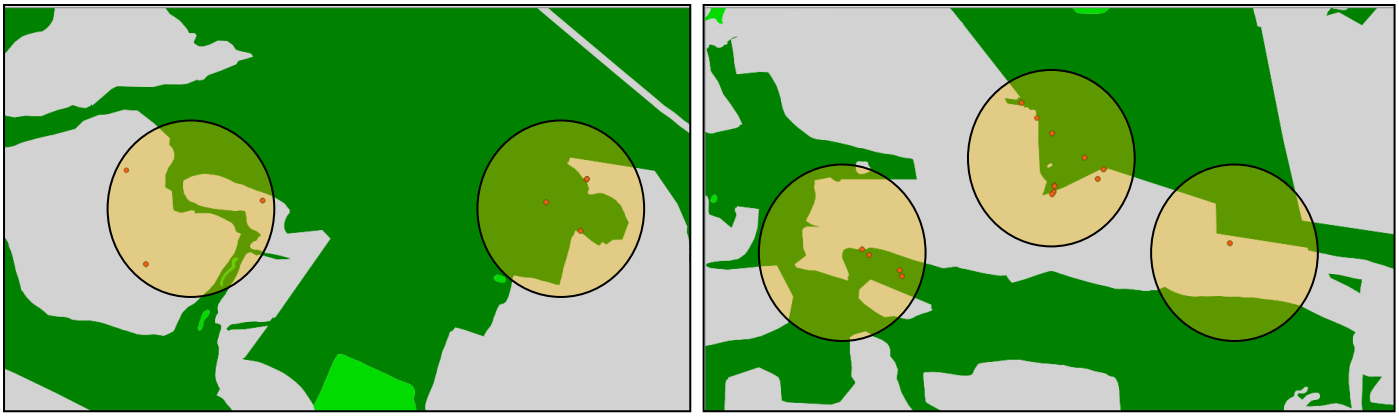


Figure 7. A zoomed in version of Figure 8 highlighting each Southern black Korhaan sighting (red dots) found within the Nuwejaars Wetlands Special Management Area boundary (thick black line) of which we identified 23 Southern Black Korhaan 'hotspots' (highlighted in yellow). Overberg habitat types (green is natural vegetation and grey is degraded/disturbed areas, most likely lands used for agriculture) are also displayed.

As the sighting data is from numerous sources, and over various durations of time (Table 4), multiple sightings of the same individual/s are possible and therefore we identified Southern Black Korhaan 'hot spots' within the Nuwejaars Wetlands SMA boundaries, where clusters of sightings were found within a 1500 m^2 radius (Figure 7). In total, 23 hotspots were identified. The habitat type (Natural or Degraded) per cluster was recorded (majority rules). Results showed that 65% of the cluster sightings were recorded on 'No Natural' habitat and only 35% were recorded in 'Natural' habitat (Figures 6, 7, 8 & 9).



Figures 8 and 9. Show close up Southern Black Korhaan sightings (red dots) of 5 of the 23 Southern Black Korhaan Hotspots (shaded yellow circles) distributed in buffer zones of natural vegetation (green shaded area) and degraded land (grey area) within the Nuwejaars Wetlands Special Management Area.

Conclusion

Database

The project resulted in capturing a large quantity of distribution data within the Heuningnes-Agulhas Plain IBA and aided us in developing an avian sighting database focusing on selected specialist, threatened and endemic bird species. Over 3 000 sightings of target species were accumulated throughout the project (Figure 10). Blue Crane sightings were the most abundant; this is largely due to the fact that the Overberg Crane Group's Chairman, Keir Lynch, uses this platform to capture Crane population data during his work operational activities. As previously stipulated, Marsh Owl was not sighted during the project, Cape Eagle-Owl and Greater Painted-Snipe were also very rare, with only one sighting each (Figure 10).

The data collected contributes to the SABAP2's extensive database. Contributing to SABAP is fundamental in determining the distribution range and conservation status of bird species, establishing Important Bird and Biodiversity Areas, and the data is also utilised for further research by academics.

The project endeavoured to atlas all the pentads within the Heuningnes-Agulhas Plain IBA, however due to time constraints and accessibility restrictions some pentads were not monitored. When looking at sighting abundance (total avian species, total target species, number of sightings etc), it is evident that ad-hoc monitoring yields higher results than full protocol atlassing (Table 2). Ad-hoc sightings were sightings that were captured during routine daily activities, so when out in the field, or driving between properties, if a target species was seen, it was logged. If we were informed of target species sightings by landowners, these were verified in field and then recorded on Birdlasser too. While this kind of data capture is biased, as not all areas and vegetation types are covered, it did prove useful in quantity of sightings. For this reason, the NWSMA will continue to record all sightings of the listed target species in order to increase the database for the NWSMA area, and beyond. It is a very cost-effective way to gather information as it can be done 'on-the-job' and logging a sighting takes a few seconds.

The resulting project database will be maintained by the Overberg Crane Group, and provides the Overberg conservation NGOs and potential students with an overview of threatened bird species distribution, which can be utilised to analyse short and long term trends pertaining to population demography and avian habitat preference. The data collected from this project was used in combination

with additional SABAP/Birdlasser data in order to analyse the Southern Black Korhaan habitat preference within the Overberg, and to identify core populations and those in need of active management and protection or other conservation measures. This demonstrates the value of the database in research and applied conservation.

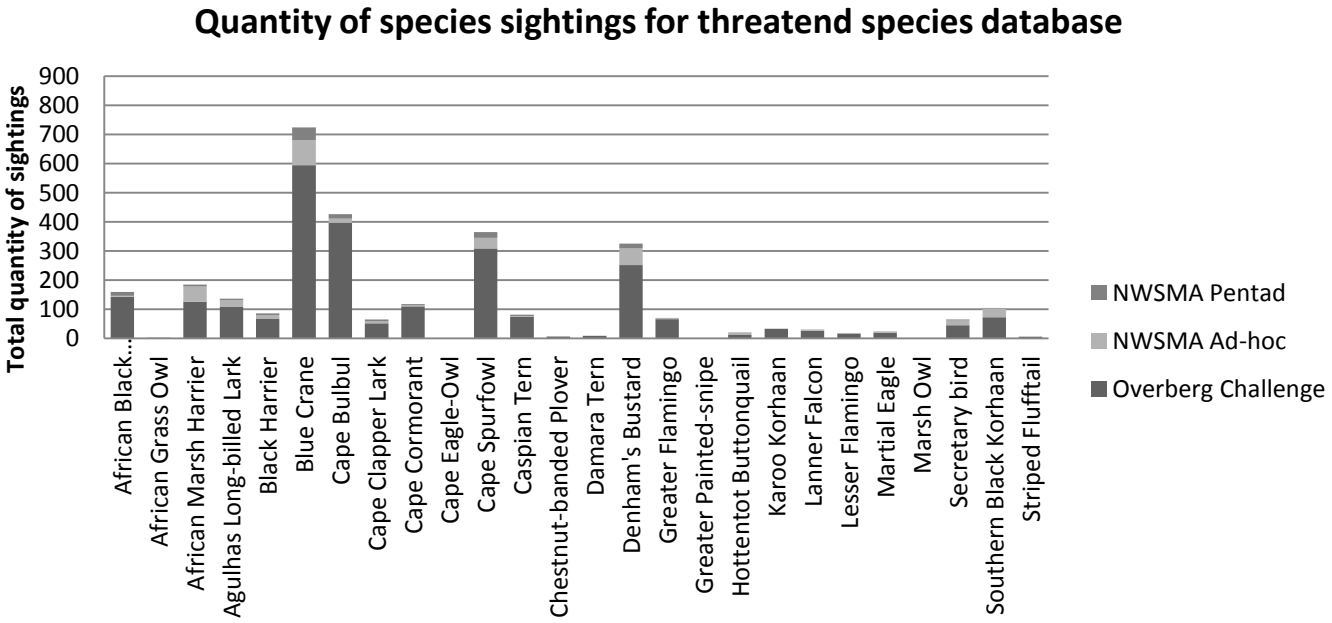


Figure 10. The results of the project's target species sightings.

Southern Black Korhaan focus

Southern Black Korhaan is mostly absent from pristine natural vegetation that is too dense or too high for visibility and mobility (Turner, 2015) (Figure 11 & 12).

Figure 11, 12 and 13. Photos depicting favourable habitat types that the Southern Black Korhaan 'of the NWSMA' are found in. Top left (11), a SBK in Elim Fynbos on Vlooikraal Farm. Top right (12) Elim Fynbos on Riverside Farm. Bottom photo (13) Southern Black Korhaan in agricultural environment, stubble on Visserdrifts Farm.

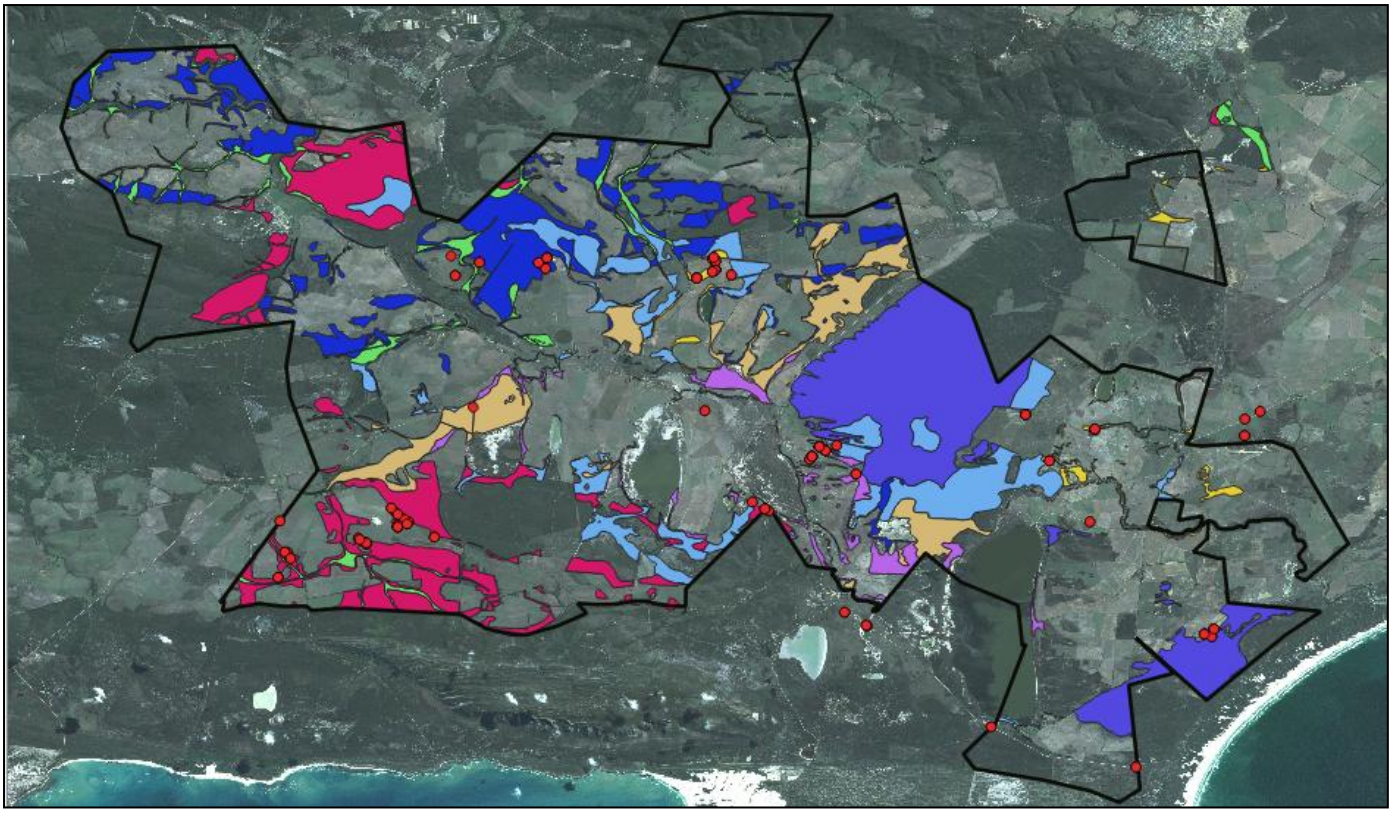


Figure 14. Map depicting the vegetation units associated with SBK sightings (red dots). Pink represents Elim Fynbos, Dark Blue is Elim Astereacious Fynbos, Green is Elim Riparian Wetland, Yellow is Renoster Fynbos, Brown Restioid Wetland and Purple is representative of Renosterveld.

As per the Nuwejaars Wetlands SMA Biodiversity Management Plan, the natural vegetation has been classified into 19 different vegetation units (Davies, 2009). When these units were applied to the Southern Black Korhaan sightings and hotspots, a crude analysis showed that when in natural veld, they prefer Elim Fynbos or Renosterveld (Figure 14).
The Elim fynbos habitat is restricted to the lowlands (seldom above 100 m) and occurs on shale, silcrete and on limestone pavements. The vegetation tends to be low in stature and is seldom more than a 1 m tall even in old veld, providing ideal habitat for Southern Black Korhaan (Davies, 2009) (Figure 14).

Overall, sightings extracted from historic IBA cause data, Overberg Challenge and the NWSMA's own data collection, showed that all Southern Black Korhaan within the NWSMA, were generally localised. The birds were mostly found in the agricultural lands bordering a patch of natural veld, or in the buffer zone directly at the edge of the veld (Figures 6 -9 and Figures 11-14).

The literature reveals that this species generally shows a distinct preference for natural habitats over transformed land, however it has been found on cultivated lands, and this is probably where natural habitat is fragmented, as shown in the NWSMA. It is likely that the Southern Black Korhaan make use of agricultural lands for feeding and could be taking advantage of the plant material such as seeds and green shoots, which are in rich supply in the cultivated landscape during planting seasons. This seems to be presently sustaining the birds and providing adequate resources, as cluster sightings of Southern Black Korhaan revealed that the birds stayed in the same area for at least a year (Figure 7 & 8). On reviewing the dates of the sightings within the identified hotspots, we found that records in the same area had varying dates attached to them i.e sightings in the Heuningrug Farm cluster ranged from 23/08/2017 to 10/08/2018. NWSMA staff confirms that the hotspots highlighted have had Southern Black Korhaan sightings for consecutive years.

Nuwejaars Wetlands SMA is an important and valuable threatened system that provides habitat for the specialist Southern Black Korhaan and appears to be the stronghold for the species in the Overberg according to sightings submitted to the database. The NWSMA, comprising 25 private landowners, covers approximately 45,000 hectares on the Agulhas Plain and is a 'first of its kind' innovative approach to land management that combines commercial agriculture with conservation. Through the Nuwejaars Wetlands

Landowners Association (NWLOA) landowners have secured their long-term commitment to the Constitution and Conservation Development Framework by formally protecting their land and its biodiversity through registering restrictive conditions against their title deeds, in favour of conservation. This means that the natural vegetation is protected in perpetuity, which is the first step in conserving this species.

Recommendations and the way forward

The information derived from this report, as a result of analysing the sighting data, shows just how valuable such a database is in order to identify core populations of threatened species.

Below is our proposal for the next phase in the project, which aims at continuing to collect data, to better understand population trends and threats, and develop appropriate conservation actions in our protected area.

As we have identified Southern Black Korhaan hotspots in the IBA in the Nuwejaars SMA, we hope to now:

- Continue contributing to database by logging all ad-hoc sightings of listed Target Species.
- Continue monitoring our core population 'cluster spots' (especially peak breeding season)
- Evaluate and assess habitat type, quality and sustainability of identified core areas. Survey the environmental characteristics of fragments (size of fragments, vegetation cover and vegetation height).
- Determine the Area of Occupancy by isolating the habitat that the SBK has been recorded in and identify prime SBK habitat within the NWSMA, and determine potential for expansion of the core habitat (utilising the fire, alien and biodiversity management plans to inform us of suitable sites as a desk top study - then applying suitability modelling);
- Development of a conservation strategy for the species in the Nuwejaars with application for the broader on the Agulhas Plain and Overberg;
- And implement habitat expansion measures.

This work is vital, if we're to stem the losses – and put the Southern Black Korhaan and other target species on a positive growth trajectory. For the Nuwejaars SMA (and the broader Overberg), this is particularly important, given our appropriate habitat for these vulnerable and endangered species. BUT: We have a long way to go, and look forward to potentially partnering with our wonderful Target Species Project partners in the future again.

Acknowledgments

We acknowledge and thank the Tygerberg Bird Club, who generously donated R20 000.00 toward this project for fuel and labour costs (the Nuwejaars Wetlands Special Management Area co-funded the remaining costs.) Thanks to you (the Tygerberg Bird Club), and your dedication to protect our rich bird life, we are able to better understand our threatened bird species, and to respond with appropriate conservation action. This work is still in its infancy – and your support has laid the foundation for this conservation action. Your support has been recognised in our 2017/2018 annual report, as well as on our website and our social media channels. Thank you!

We are also extremely grateful to BirdLife SA, The Overberg Crane Group and Overberg Renosterveld Conservation Trust who were all responsible for developing the Overberg Challenge - which proved highly successful. Thank you for together developing this wonderful partnership.

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