

Komsberg West Wind Farm

Komsberg Wind Farms (Pty) Ltd

Final layout avifaunal walk through

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1. Introduction

Komsberg Wind Farms (Pty) Ltd (KWF) received environmental authorization in 2016 for the Komsberg West Wind Farm, which was subsequently amended in 2019. The avifaunal studies were conducted by Arcus Consultancy Services South Africa (Pty) Ltd (2016, 2019).

The avifaunal amendment report compiled by Arcus in 2019 concluded by recommending that:

“.. a habitat and nest survey (the latter focussed on searching for Martial Eagle and Verreaux’s Eagle nests) be conducted preconstruction, in winter or spring, to confirm that there has been no significant change in the receiving environment since the original assessment. The results of this survey must inform whether any additional pre-construction monitoring is warranted to update the avifaunal baseline for operational comparison. Updated data sets following additional pre-construction monitoring (if required) will allow for more meaningful comparison with operational monitoring data, and the additional monitoring must also be used to advise the final micro-siting of the WEF, if applicable.”

During April 2021 KWF commissioned WildSkies Ecological Services (Pty) Ltd to conduct an updated nest and habitat survey and final avifaunal walk through to ensure that all priority species nests and any other sensitive habitats are known and to confirm the acceptability of the project layout. The nest and habitat survey full findings are reported on separately (WildSkies, 2021). This current report focuses on the avifaunal walk through.

The final facility layout is presented in Figure 1.

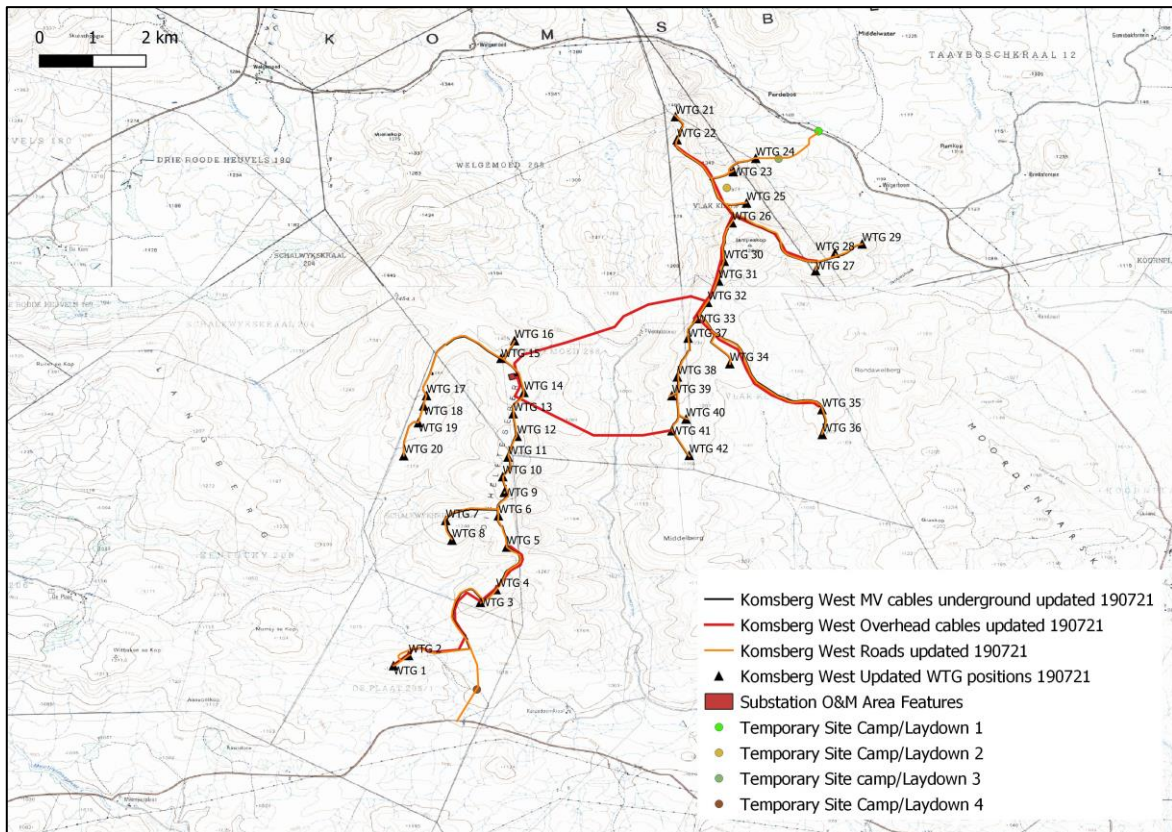


Figure 1. The layout of the Komsberg West Wind Farm.

2. Methodology

The methods employed for this final avifaunal walk through survey were as follows:

- All available avifaunal information and documents for the Komsberg West Wind Farm were examined.
- The site was surveyed over a period of 7 days in April 2021. This was done as follows:
 - Drive or walk to within suitable view of all cliffs and large trees (and man made vertical structures) in the area
 - Scan the above using binoculars and spotting scope
 - Conduct observations of likely areas to detect any indicative bird behaviour
 - Where nests are found, photograph where possible, identify to species, and obtain accurate location
 - Where necessary nests were approached closer on foot to examine the nest structure and prey remains
 - Survey site for any other potential constraints to wind farm development (e.g. Blue Crane nests, roosts etc)

- Examine the planned layout to identify any changes required based on avifaunal factors

3. Findings & recommendations

The key findings are described below.

- A total of 30 bird nests were identified within or close to the site including corvids (crows & ravens), Jackal Buzzard *Buteo rufofuscus*, Pale Chanting Goshawk *Melierax canorus*, Hamerkop *Scopus umbretta*, Verreaux's Eagle *Aquila verreauxii* and Martial Eagle *Polemaetus bellicosus*. Some of these nests were already known from previous studies and were re-visited, and some were newly built nests. The most important of these nests are the 3 Martial Eagle nests and 10 Verreaux's Eagle nests (4 being alternates in the same territory at Anysrivier). An eleventh nest at Spitzkop farm in the south could only be viewed in the distance and has been classified as Verreaux's Eagle as a precautionary approach.
- No other sensitive avifaunal features were identified during the survey. With the exception of large eagles the site appears to have a relatively low diversity and abundance of avifauna.
- Although not the primary purpose of the survey a species list was kept during the survey. A total of 50 species were recorded. No new significant species were recorded in addition to those recorded originally by pre-construction monitoring on site (Arcus, 2016). Red Listed species records from the recent survey included Verreaux's (Vulnerable) and Martial Eagle (Endangered), Lanner Falcon *Falco biarmicus* African Rock Pipit *Anthus crenatus* (Near-threatened) and Karoo Korhaan *Eupodotis vigorsii* (Near-threatened).

Based on the above findings, the following recommendations were made to KWF:

- Given that the project is already authorised and that some of the key eagle nests have been built subsequent to the EIA, current best practice in terms of nest buffer sizes cannot reasonably be applied to its full extent.
- We recommend that nest buffers applied are as close as possible to best practice size, and where they fall short additional mitigation measures are designed to ensure further protection for the birds.
- We recommend a 3km circular no-go buffer around Martial Eagle nests.
- For Verreaux's Eagle we recommend a 2km circular no-go buffer around each nest.
- We recommend a 750m buffer for Jackal Buzzard nests, 500m for Pale Chanting Goshawk, 1000m for Hamerkop, and 250m for Corvid nests. These buffers are slightly softer (High sensitivity rather than No-go) since these species are not Red Listed. Turbines may infringe upon these buffers slightly if absolutely necessary.

- Since the buffers recommended do not achieve current best practice protection for these bird species, there will still be some residual turbine collision risk which will require mitigation. We recommend that all turbines have one blade painted from the outset to provide further mitigation. This applies to all turbines on site.
- We recommend that all overhead MV line be installed with bird flappers or a similar line marking device, to mitigate for bird collision. The exact pole design for the overhead MV line is not yet known. The final pole design must adhere to the Eskom/EWT guidelines in terms of bird friendly structures. Once available the final pole design be shown to a suitably qualified avifaunal specialist prior to construction to confirm that it will suitably prevent bird electrocution risk.

Figure 2 shows the final facility layout relative to the original avifaunal sensitivity mapping ('Komsberg_high_avifaunal_sens) and the newer Martial Eagle and Verreaux's Eagle no-go buffers. The final layout is acceptable from an avifaunal perspective.

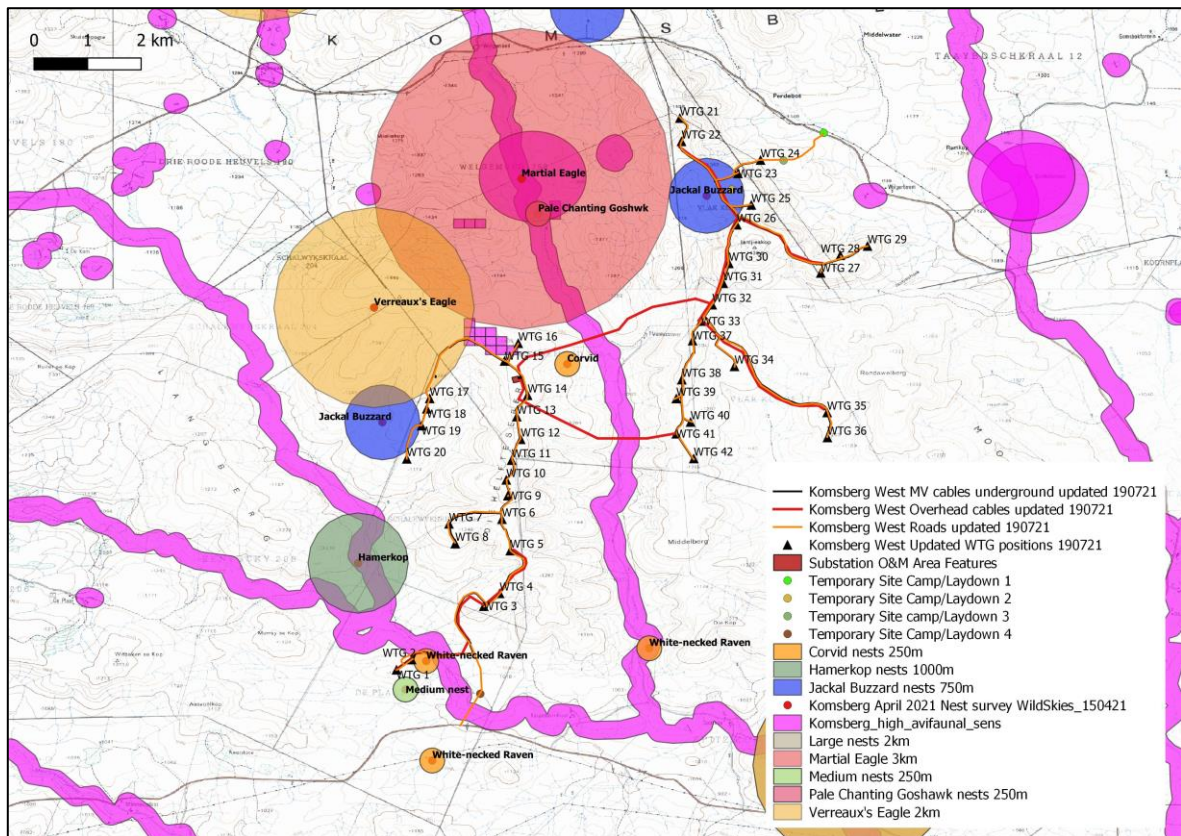


Figure 2. The final facility layout with avifaunal sensitivity mapping.

4. Conclusions

We hereby confirm that the final project layout conforms with the above recommendations and with all avifaunal sensitivities identified by the various avifaunal studies on the site to date. There are no micro changes to any of the infrastructure required. We recommend that the final layout be approved/authorised.

We further recommend that in addition to all mitigation measures recommended by previous avifaunal work on the site, that additional mitigation in the form of blade painting for all turbines be implemented. One blade on each turbine should be painted either red or black according to CAA requirements. This applies to all turbines on site.

We recommend that all overhead MV line be installed with bird flappers or a similar line marking device, to mitigate for bird collision. The exact pole design for the overhead MV line is not yet known. The final pole design must adhere to the Eskom/EWT guidelines in terms of bird friendly structures. Once available the final pole design be shown to a suitably qualified avifaunal specialist prior to construction to confirm that it will suitably prevent bird electrocution risk.

5. References

Arcus Consultancy, 2016. Komsberg Wind Energy Facility: Avifaunal Impact Assessment Report.

Arcus Consultancy, 2019. Komsberg West Wind Farm amendment application: updated avifaunal impact assessment.

BirdLife South Africa. 2017. Verreaux's Eagle and Wind Farms: Guidelines for Impact Assessment, monitoring and mitigation. BirdLife South Africa Occasional Report Series.

IUCN 2021. IUCN Red List of Threatened Species.

Jenkins, A.R., Van Rooyen, C.S., Smallie, J., Harrison, J.A., Diamond, M., Smit-Robbinson, H.A. & Ralston, S. 2015. "Best practice guidelines for assessing and monitoring the impact of wind energy facilities on birds in southern Africa" Unpublished guidelines

Taylor, M. R, Peacock, F., & Wanless, R. 2015. The 2015 Eskom Red Data Book of Birds of South Africa, Lesotho & Swaziland.

Komsberg East & West Wind Farms

Komsberg Wind Farms (Pty) Ltd

Avifaunal nest & habitat survey

April 2021



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1. Introduction

Komsberg Wind Farms (Pty) Ltd (KWF) received environmental authorization in 2016 for the Komsberg East and Komsberg West Wind Farms, which EAs were subsequently amended in 2019. A condition of the authorization was that a nest and habitat survey should be conducted and should inform the final layout.

Specifically, The avifaunal amendment report compiled by Arcus in 2019 as part of the authorization amendment process concluded by recommending that:

“.. a habitat and nest survey (the latter focussed on searching for Martial Eagle and Verreaux’s Eagle nests) be conducted preconstruction, in winter or spring, to confirm that there has been no significant change in the receiving environment since the original assessment. The results of this survey must inform whether any additional pre-construction monitoring is warranted to update the avifaunal baseline for operational comparison. Updated data sets following additional pre-construction monitoring (if required) will allow for more meaningful comparison with operational monitoring data, and the additional monitoring must also be used to advise the final micro-siting of the WEF, if applicable.”

KWF commissioned WildSkies to conduct a nest and habitat survey to ensure that they are aware of all nests and any other sensitive habitats that may influence the finalisation of the layout, and to advise whether any further monitoring was required to update the avifaunal baseline.

Further terms of reference are as follows: *“The nest/ habitat survey should thus cover the full extent of the properties provided in the attached, as well as the surrounding area to the extent necessary to identify any nearby nest locations that may impact the layout. The survey should not be limited by the attached layouts, since we might end up moving turbines anywhere within the boundaries of the properties.”*

The original avifaunal assessment and amendment thereto for the projects and known nests and avifaunal sensitivities (Arcus, 2016 & 2019) were supplied to WildSkies by ACED. In addition, where available reports and nest locations from neighbouring sites were also made available, or found by WildSkies online.

The two sites are presented in Figure 1.



Figure 1. The layout of the Komsberg East & Komsberg West Wind Farms Area of Interest (AoI).

2. Methodology

The methods employed for this survey were as follows:

- All available information for the Komsberg and neighbouring projects was examined to identify known or suspected nest locations (Arcus, 2016; Arcus, 2019; Chris van Rooyen Consulting, 2016a & b).
- Meetings were held with Andrew Pearson, the original avifaunal specialist for the projects, to obtain as much information as possible.
- Desktop delineation of the Area of Influence (6km buffer around site boundaries- based on Martial Eagle *Polemaetus bellicosus* nest buffer size) and preliminary identification of likely habitat was conducted.
- The AoI was surveyed over a period of 7 days in April 2021. This was done as follows:
 - Drive or walk to within suitable view of all cliffs and large trees (and man made vertical structures) in the AoI
 - Scan the above using binoculars and spotting scope
 - Conduct observations of likely areas to detect any indicative bird behaviour

- Where nests are found, photograph where possible, identify to species, and obtain accurate location
- Where necessary nests were approached closer on foot to examine the nest structure and prey remains
- Survey site for any other potential constraints to wind farm development (e.g. Blue Crane nests, roosts etc)
- Examine the planned layout to identify any changes required based on avifaunal factors
- Plot nests in GIS
- Consult any relevant guidelines (NB Verreaux's Eagle)
- Develop necessary buffers or other mitigation measures
- Consolidate all into 'constraints' shape file/KMZ

Overall a good level of coverage of the site was achieved. The timing of the survey was early in raptor breeding season and hence suitable for a survey of this type. One notable gap in coverage is off site to the south of Komsberg West on the Spitzkop property, which was locked, Good cliff exists along the river on this farm, and one large nest could be seen. It is probable that a Verreaux's Eagle nest exists on these cliffs even if it is not the one seen. Two Verreaux's Eagle nests identified previously by Andrew Jenkins north of Komsberg East could not be visited due to time constraints. These nests have also already been accommodated in the layout design earlier in the project.

3. Findings

The findings are described below:

3.1 Bird nests

A total of 30 bird nests were identified within or close to the Aol including corvids (crows & ravens), Jackal Buzzard *Buteo rufofuscus*, Pale Chanting Goshawk *Melierax canorus*, Hamerkop *Scopus umbretta*, Verreaux's Eagle *Aquila verreauxii* and Martial Eagle *Polemaetus bellicosus*. In some cases with medium sized nests the species could not be determined (although large eagles were ruled out, based on both nest and nest material size).

A table of these nests and photographs is presented in Appendix 1.

The most important of these nests are the raptor nests, and in particular those of large eagles. Three of these are Martial Eagle nests and ten are Verreaux's Eagle *Aquila verreauxii* nests (4 being alternates in the same territory at Anysrivier). An eleventh nest at Spitzkop farm in the south could only be viewed in the distance and has been classified as Verreaux's Eagle as a precautionary approach.

The location of these nests is shown in Figure 2 (and Appendix 1). Several of the nests are too far from the two turbine layouts to have any effect when buffers are applied, but are included here to be thorough.

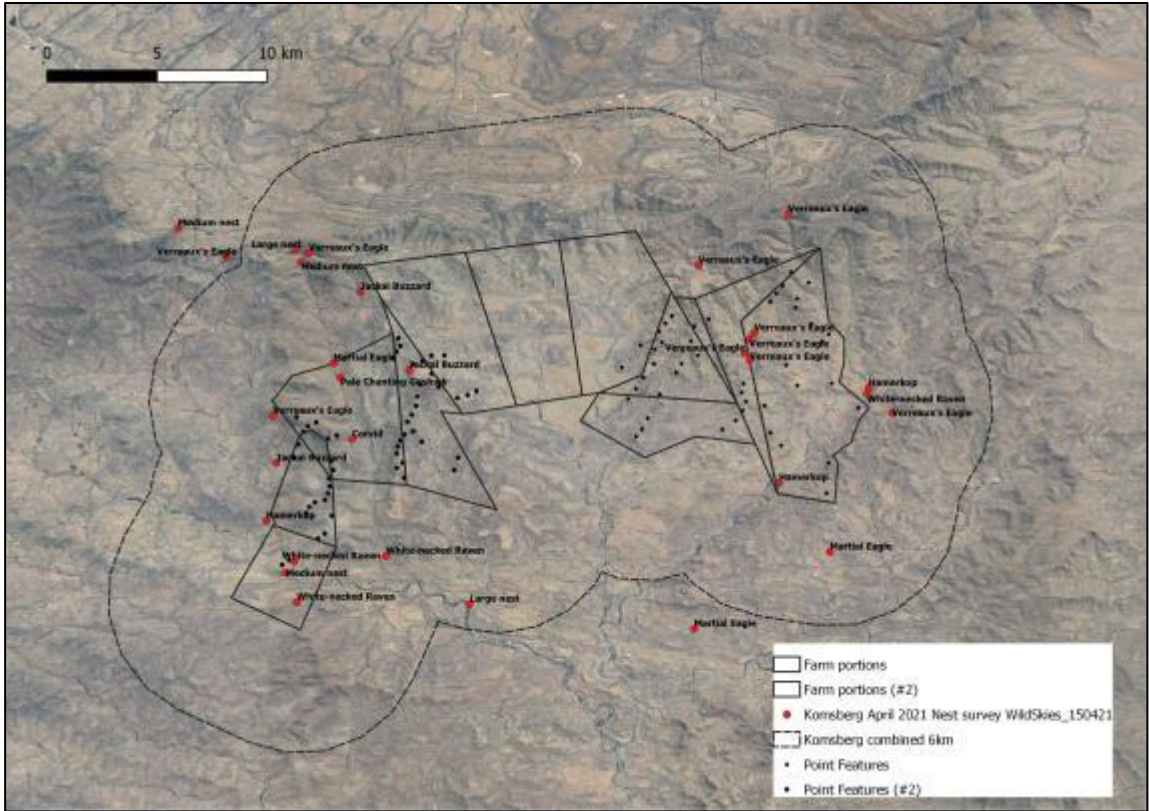


Figure 2. Bird nest locations on site. This figure is repeated in Appendix 1 for ease of viewing at better scale.

3.2 Other avifaunal features

No other sensitive avifaunal features were identified during the survey. With the exception of large eagles the site appears to have a relatively low diversity and abundance of avifauna.

Although not the primary purpose of the survey a species list was kept for the site. A total of 50 species were recorded (Appendix 2). No new significant species were recorded in addition to those recorded originally by pre-construction monitoring on site (Arcus, 2016). Red Listed species records from the recent survey included Verreaux's (Vulnerable) and Martial Eagle (Endangered), Lanner Falcon *Falco biarmicus* African Rock Pipit *Anthus crenatus* (Near-threatened) and Karoo Korhaan *Eupodotis vigorsii* (Near-threatened).

4. Recommendations

This nest and habitat survey has identified a relatively large number of nests on and near the site. Some of these represent new information for the projects (which are already authorised). Designing a way forward which provides sufficient protection to birds whilst enabling the projects to proceed will require collaboration and discussion.

The below tabular plan was prepared for consideration in the layout finalisation process. Given that the project is already authorised and that some of the key eagle nests have been built subsequent to the EIA, current best practice in terms of nest buffer sizes cannot be fully applied retrospectively. A compromise approach is recommended whereby nest buffers applied are as close as possible to best practice size, and where they fall short additional mitigation measures are designed to ensure further protection for the birds.

A 3km circular buffer is recommended around Martial Eagle nests. This will affect relatively few turbine positions in the 2019 layouts (two on Komsberg West & 1 on Komsberg East). For Verreaux's Eagle a 2km buffer is recommended - which would affect ten (4 on Komsberg West & 6 on Komsberg East) turbine positions in total across both projects, in the 2019 layout. Two large unidentified nests were assigned a 2km buffer as a precaution. Unidentified medium nests were assigned 250m on the basis that they were probably corvid nests. A 750m buffer is recommended for Jackal Buzzard nests, 1000m for Hamerkop and 250m for Corvid and Pale Chanting Goshawk. In the case of these last four mentioned species the buffers can be reduced in size where necessary and with avifaunal specialist input.

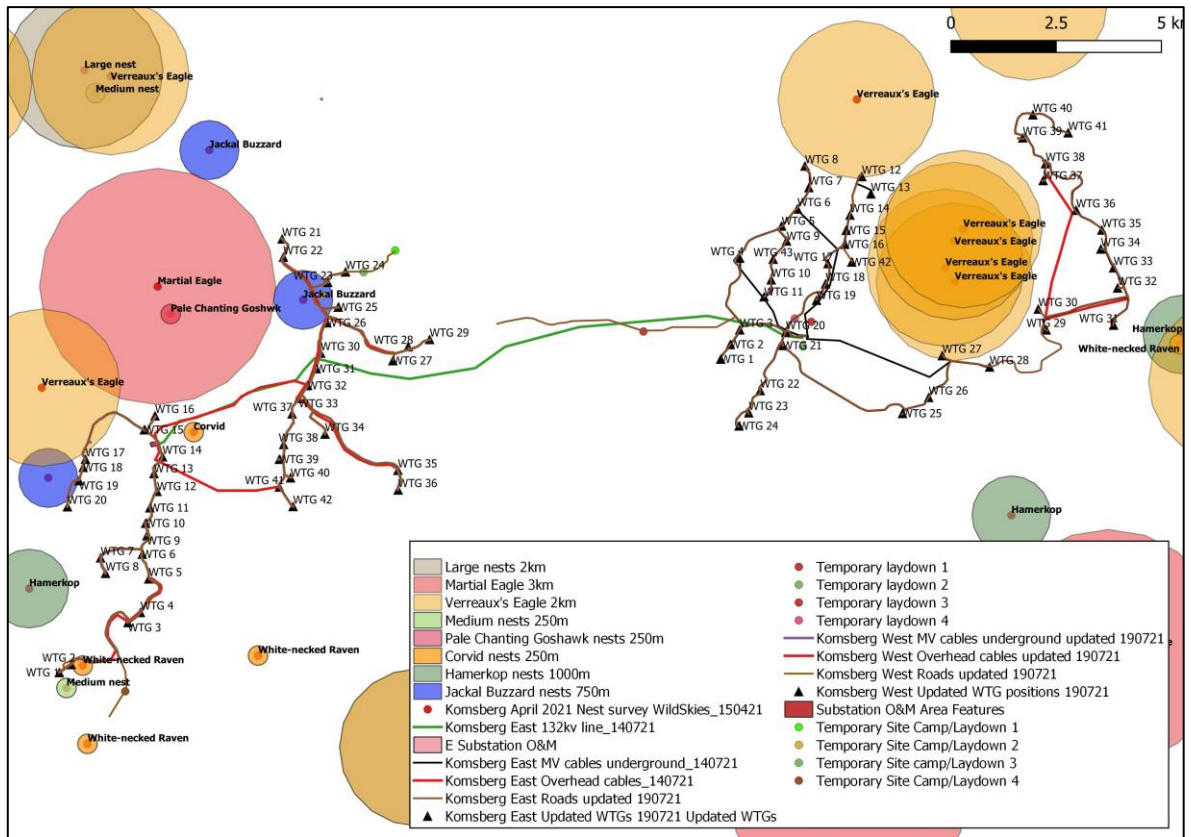


Figure 3. Bird nests and their recommended buffers.

Despite the recommended buffers, there may still be some residual turbine collision risk which will require mitigation. We recommend that all turbines have one blade painted from the outset to provide further mitigation. Although this measure is so far unproven in South Africa, there is an opportunity to trial it at these sites. One blade on each turbine should be painted either red or black according to CAA requirements. This should be applied to all turbines on site.

Table 1 presents the recommendations arising from the survey.

Table 1. Summary of eagle nest mitigation plan.

Species	Current clearance from nearest turbine locations	Best practice nest buffer size	Komsberg nest buffer recommendation	Additional proactive mitigation
Martial Eagle	2 nests, Welgemoed 2.7km and Swaerskraal 3.2km	No published guidelines, unofficial best practice is 6km	3km	Blade painting – all turbines
Verreaux's Eagle	Schalkwykskraal 1km Anysrivier 1.2km Dwarsrivier 1.6km	Published guidelines require 3km. In prep update of guidelines require either use of VERA or 3.7 – 5.2km	2km	Examine road locations relative to nests to avoid breeding disturbance during construction – NB at Anysrivier Blade painting – all turbines
Jackal Buzzard	Vlakkloof 350m Schalkwykskraal 860m	None	750m	None
Pale Chanting Goshawk	Welgemoed 2.6km	None	500m nest buffer	None
Hamerkop	Dwarsrivier 1.1km Anysrivier 2km Schalkwykskraal 1.8km	None	1km nest buffer	None
Corvids (crows & ravens)	Various	None	250m	None

5. Conclusion

As a result of the recommendations detailed in Section 4, the project layout was revised and now complies with all recommendations. No further pre-construction monitoring is required to update the avifaunal baseline.

6. References

Arcus, 2016. Komsberg Wind Energy Facility: Avifaunal Impact Assessment Report.

Arcus, 2019. Great Karoo Wind Energy Facility: Updated Bird Impact Assessment.

BirdLife South Africa. 2017. Verreaux's Eagle and Wind Farms: Guidelines for Impact Assessment, monitoring and mitigation. BirdLife South Africa Occasional Report Series.

Chris van Rooyen Consulting, 2016a. Maralla East Bird Impact Assessment Study.






Chris van Rooyen Consulting, 2016b. Maralla West Bird Impact Assessment Study.






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Jenkins, A.R., Van Rooyen, C.S., Smallie, J., Harrison, J.A., Diamond, M., Smit-Robbinson, H.A. & Ralston, S. 2015. "Best practice guidelines for assessing and monitoring the impact of wind energy facilities on birds in southern Africa" Unpublished guidelines






Taylor, M. R, Peacock, F., & Wanless, R. 2015. The 2015 Eskom Red Data Book of Birds of South Africa, Lesotho & Swaziland.


Appendix 1. Bird nests.

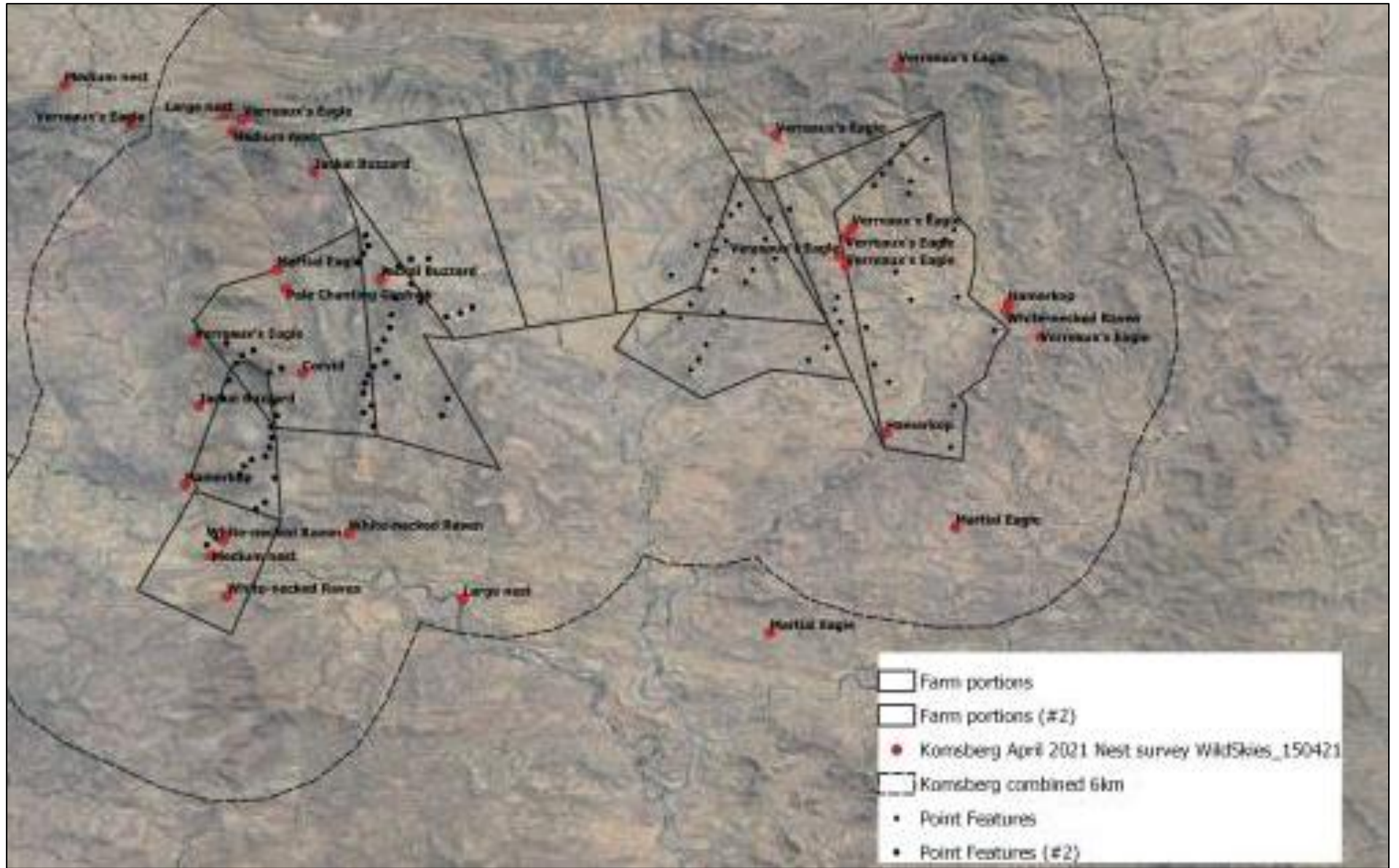
ID	Name	Species	Photograph
1	Welgemoed ME	Martial Eagle Adult flushed from nest	
2	Welgemoed PCG	Pale Chanting Gos-hawk No birds seen	
3	Welgemoed Cor	Corvid – adults present	None
4	Middelberg WNR	White-necked Raven – adults present	None
5	De Plaat Medium	Medium nest No birds present – presumed Jackal Buzzard	
6	De Plaat WNR	White-necked Raven – adults present	None
7	De Plaat WNR pylon	White-necked Raven – adults present	None
8	Schalkwykskraal Ham	Hamerkop Hollow nest constructed of mud has collapsed	
9	Schalkwykskraal VE	Verreaux's Eagle No birds present. Etienne Albertyn – adult incubating two eggs Oct 2020	

10	Schalkwykskraal JB	Jackal Buzzard Adults present	
11	Schietfontein Medium	Medium nest No birds present – presumed Verreaux's Eagle alternate nest	None
12	Schietfontein Large	Large nest Adult eagle nearby – presumed alternate nest or possible Hamerkop	
13	Schietfontein VE	Verreaux's Eagle Adult nearby – fresh whitewash	
14	Klipsweetkrans VE	Verreaux's Eagle No birds present	
15	Komsberg Pass top med	Medium nest No birds present – presumed Jackal Buz- zard	

16	Anysrivier VE1	Verreaux's Eagle Adult eagles present in territory	
17	Anysrivier VE2	Verreaux's Eagle Adult eagles present in territory	
18	Anysrivier VE3	Verreaux's Eagle Adult eagles present in territory	
19	Anysrivier VE4	Verreaux's Eagle Adult eagles present in territory	
20	Dwarsrivier Hamerkop	Hamerkop No birds present	
21	Dwarsrivier WNR	White-necked Raven Adult birds present	

22	Anysrivier Ham	Hamerkop No birds present	
23	Vlakkloof JB	Jackal Buzzard No birds present, smaller nest built on-top of large nest & under low roof – Jackal Buzzard	
24	Brandhoek JB	Jackal Buzzard No birds present	
25	Dwarsrivier VE	Verreaux's Eagle No birds present, fresh whitewash	
26	Spitzkop large	Large nest No birds present, presumed Verreaux's Eagle on precautionary basis for buffers	None
27	Swaerskraal ME	Martial Eagle No birds present	

28	Swaerskraal ME2	<p>Martial Eagle</p> <p>No birds present Different location to that from Andrew Jenkins, confirmed no nest at his location</p>	
29	Boteshoek VE (Unconf, AJ data)	<p>Verreaux's Eagle</p> <p>Not accessed</p>	None
30	Sterboomhoek VE (Unconf, AJ)	<p>Verreaux's Eagle</p> <p>Not accessed</p>	None



Appendix 2. Bird species list.

Species primary name	Species tertiary name
Acacia Pied Barbet	<i>Tricholaema leucomelas</i>
African Rock Pipit	<i>Anthus crenatus</i>
Bokmakierie	<i>Telophorus zeylonus</i>
Brown Scrub Robin	<i>Cercotrichas signata</i>
Brown-throated Martin	<i>Riparia paludicola</i>
Cape Bunting	<i>Emberiza capensis</i>
Cape Clapper Lark	<i>Mirafrapa apiata</i>
Cape Robin-Chat	<i>Cossypha caffra</i>
Cape Spurfowl	<i>Pternistis capensis</i>
Cape Teal	<i>Anas capensis</i>
Chat Flycatcher	<i>Melaenornis infuscatus</i>
Crowned Lapwing	<i>Vanellus coronatus</i>
Familiar Chat	<i>Oenanthe familiaris</i>
Fiscal Flycatcher	<i>Melaenornis silens</i>
House Sparrow	<i>Passer domesticus</i>
Jackal Buzzard	<i>Buteo rufofuscus</i>
Karoo Chat	<i>Emarginata schlegelii</i>
Karoo Korhaan	<i>Eupodotis vigorsii</i>
Karoo Long-billed Lark	<i>Certhilauda subcoronata</i>
Karoo Prinia	<i>Prinia maculosa</i>
Lanner Falcon	<i>Falco biarmicus</i>
Large-billed Lark	<i>Galerida magnirostris</i>
Lark-like Bunting	<i>Emberiza impetuani</i>
Laughing Dove	<i>Spilopelia senegalensis</i>
Little Swift	<i>Apus affinis</i>
Martial Eagle	<i>Polemaetus bellicosus</i>
Mountain Wheatear	<i>Myrmecocichla monticola</i>
Neddicky	<i>Cisticola fulvicapilla</i>
Pale Chanting Goshawk	<i>Melierax canorus</i>
Pale-winged Starling	<i>Onychognathus nabouroup</i>
Pied Crow	<i>Corvus albus</i>
Pied Starling	<i>Lamprotornis bicolor</i>
Red-eyed Dove	<i>Streptopelia semitorquata</i>
Red-winged Starling	<i>Onychognathus morio</i>
Ring-necked Dove	<i>Streptopelia capicola</i>
Rock Kestrel	<i>Falco rupicolus</i>
Rufous-eared Warbler	<i>Malcorus pectoralis</i>
Rufous-naped Lark	<i>Mirafrapa africana</i>
South African Shelduck	<i>Tadorna cana</i>
Southern Fiscal	<i>Lanius collaris</i>
Speckled Mousebird	<i>Colius striatus</i>

Speckled Pigeon	<i>Columba guinea</i>
Spike-heeled Lark	<i>Chersomanes albofasciata</i>
Spotted Eagle-Owl	<i>Bubo africanus</i>
Tractrac Chat	<i>Emarginata tractrac</i>
Verreaux's Eagle	<i>Aquila verreauxii</i>
White-backed Mousebird	<i>Colius colius</i>
White-necked Raven	<i>Corvus albicollis</i>
White-throated Canary	<i>Crithagra albogularis</i>
Yellow Canary	<i>Crithagra flaviventris</i>