

ADDENDUM TO:

**RHEBOKSFONTEIN-AURORA POWER
LINE ALTERNATIVES 1A-E Avian Basic
Assessment**



Prepared for:



Prepared by:



Introduction

The following report is an Addendum to the Basic Assessment Report (Simmons & Martins 2015) for the proposed alternative 132 kV power lines to export power from the Rhebokfontein wind farm near Darling, Western Cape. This is required to re-examine expected impacts arising from changes in the final routing of the power lines.

Specifically five alternative routings were considered to avoid the main areas of avian impacts in the pans on the southern section of the line:

- A total of 14 collision-prone birds were found, some freshly dead, in August 2015, below the power line;
- Route 1D was proposed to circumvent the problems arising from this high avian mortality near the a pan where hundreds of flamingos congregate to feed and roost;
- Mortality of threatened red-data birds included 5 Greater Flamingo and 4 Blue Cranes below the existing line;

This addendum takes into account new data provided by a rapid response to our avian report by the Endangered Wildlife Trust and Eskom, in marking the line. An inspection by Lourens Leeuwner in August 2016, following fixture of bird diverters on the line showed a much reduced mortality. This has changed the need for the re-routing of the line.

Terms of Reference for the Basic Avian assessment report are to:

- Compile an addendum to the 2015 specialist report addressing the following:
- The implications of the proposed amendments in terms of the potential impact(s);
- A re-assessment of the significance (before and after mitigation) of the identified impact(s) in light of the proposed amendments (as required in terms of the 2014 EIA Regulations).

The addendum to the report must include an impact summary table outlining the findings of the re-assessment in terms of the above mentioned assessment criteria;

- A statement as to whether the proposed amendments will result in a change to the significance of the impact assessed in the original EIA for the proposed project (and if so, how the significance would change).
- A detailed description of measures to ensure avoidance, management and mitigation of impacts associated with the proposed changes.

The re-assessment must take into account and address public comments

Summary of findings of original EIA report

The original avian component of 2015 BAR assessed the possible impacts to birds of five alternative routings of a 132kV power line (Simmons & Martins 2015). It identified a

major hotspot of avian mortality in the pans on the farms Driefontein and Slangkop (Table 1).

Table 1: Rheboksfontein Power line: **Red-listed** and other birds found dead in August 2015

Species	Reference on Map	Dist from dam 2	GPS Co-ords	
Blue Crane	DEAD BCrane1	90m	33°17'33.80"S	18°17'58.60"E
Blue Crane	DEAD BCrane2	0m	33°17'29.00"S	18°17'55.10"E
Blue Crane	DEAD BCrane3	0m	33°17'31.10"S	18°17'56.00"E
Blue Crane	DEAD BlueCrane (2013)	1,094m	33°18'38.23"S	18°18'36.32"E
Greater Flamingo	DEAD Flamingo1	90m	33°17'34.40"S	18°17'58.90"E
Greater Flamingo	DEAD Flamingo2	110m	33°17'33.80"S	18°17'57.60"E
Greater Flamingo	DEAD Flamingo3	0m	33°17'29.40"S	18°17'55.00"E
Greater Flamingo	DEAD Flamingo4	110m	33°17'42.60"S	18°18'4.60"E
Greater Flamingo	DEAD Flamingo5	140m	33°17'43.40"S	18°18'4.60"E
Unidentifiable	DEAD Goose1	60m	33°17'32.80"S	18°17'58.40"E
Spurwing Goose	DEAD SpurwingGoose1	0m	33°18'26.60"S	18°18'33.10"E
Spurwing Goose	DEAD SpurwingGoose2	1550m	33°17'29.80"S	18°17'56.30"E
Spurwing Goose	DEAD SpurwingGoose3	Collision w pylon?	33°13'2.70"S	18°15'53.20"E
Sacred Ibis	DEAD Sacred Ibis1	390m	33°17'51.80"S	18°18'7.50"E

TOTALS

Blue Crane	Greater Flamingo	Spur-winged Goose	Sacred Ibis	Unknown	Total
4	5	3	1	1	14

We therefore recommended that a third line not be constructed through the same area and instead be routed east of the proposed line.

However, since the report was written, and more importantly because of the species highlighted in our report (Simmons & Martins 2015), the Endangered Wildlife Trust (EWT) in conjunction with Eskom undertook mitigation action shortly thereafter. This comprised affixing spiral bird-diverters to the earth wires of both lines immediately around the hotspot of mortality identified (Figure 1).

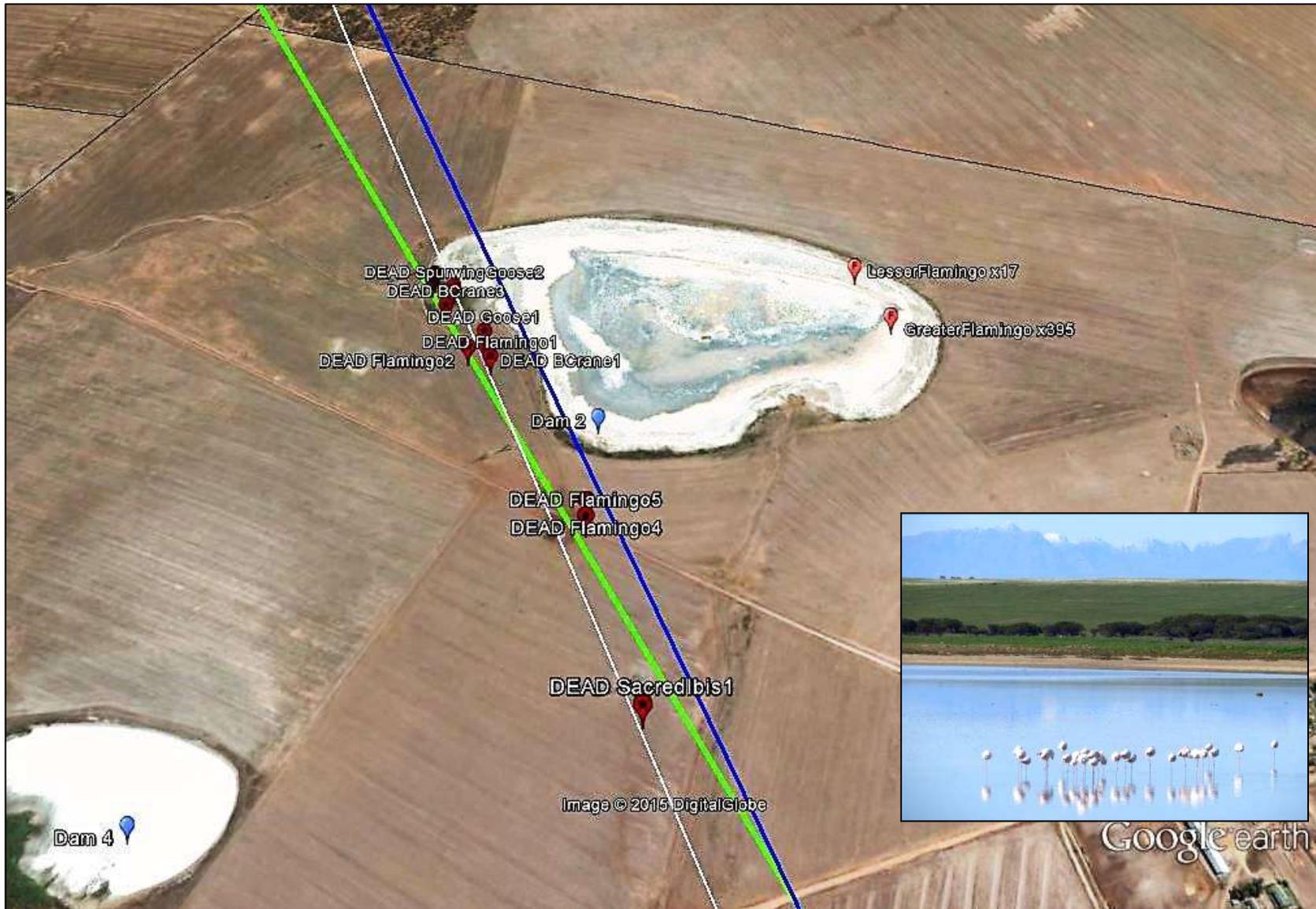


Figure 1: The hotspot of dead birds (red balloons) associated with the large pan 2 on the farm Slangkop, which held over 400 flamingos on 1 Aug 2015.

In the follow-up inspection (23 August 2016) to determine if the spiral diverters on the existing earth wires of the power lines adjacent to the pan shown in Figure 1, Lourens Leeuwner of EWT reported as follows:

"I found remains of two flamingos, the one was very old and may have been from the previous set of collisions. The other was around a month old. Both remains were underneath the earth wire of the line closest to the pan. There were also 400-500 flamingos in the pan.

The birds seem to be colliding with the earth [wire] of the existing line closest to the pan. If our observations are correct here, placing the new line on the side furthest from the pan, should actually result in no further collisions now that all earths are clearly marked. I think the situation has definitely been improved.

I definitely think that placing the [new] line parallel to existing lines would be preferable as it will also increase the overall visibility. However, I think you must insist that the new line is marked as soon as it is erected, specifically around the affected sections and

...it is of the utmost importance that the new line runs on the side furthest from the pan, and NOT between the pan and the current lines. (L Leeuwner, Renewable Energy Project Manager, Endangered Wildlife Trust, 23 August 2016).

One potential bias explaining the small number of carcasses found by this EWT inspection is the removal of carcasses by scavengers. However, we doubt this could cause any bias in the results because few scavengers were seen (no vultures occur and only Pied Crows were recorded). If mammalian predators were removing carcasses then the old remains (comprising bones and feathers) found in our August 2015 site inspection would not have occurred. So we doubt any bias results from carcass removal but we have only circumstantial evidence.

Given Mr Leeuwner's experience with avian collisions and power lines, we support his data, recommendations and suggested mitigations .

We recommend therefore that :

- The new 132 kV line running south from the Rheboksfontein wind farm that runs parallel to the existing lines is given preference over all other routings suggested previously (Simmons & Martins 2015);
- The new line has spiral bird diverters (alternating black-white-black-white) be affixed to all new earth wires as the new line is erected;
- The new 132 kV line is routed furthest from the pan where the red data birds congregate, i.e on the west-side of the existing lines. This will reduce further the likelihood that incoming birds will impact the line;
- That regular inspections (every 6 months) are made of the lines at least 1 km either side of the pan.

Re-Quantifying the impacts

Previously, our Avian Basic Assessment quantified the impacts for 8 sensitive Collision-prone species known to occur in the area. Here we re-assess those impacts with the new mitigations and routings in place.

Nature of the effect of the proposed power lines: 8 main species are expected to be negatively affected by displacement, loss of habitat or direct mortality: **Blue Crane, Greater Flamingo, Lesser Flamingo, Martial Eagle, Black Harrier, African Marsh Harrier, Peregrine and Lanner Falcons**. All of these are regular within the study sites occurring with a probability above 10% (bar the Lesser Flamingo at 8%, but included because it was recorded in nearby south options). This is especially so for the Blue Cranes and Flamingos which are already known to be killed by collision with existing power lines here. So all populations are likely to be influenced negatively.

The following table quantifies the impacts for the two flamingo species, the Blue Crane and the five raptors for each line separately. These species can also act as proxies for other large collision-prone species that occur less frequently.

The Extent (E, from 1-5) of the impact will occur along the length of the lines which will be high for all options proposed **(3)**.

The Duration (D, from 1-5) will be permanent **(5)** for the lifetime of both power lines for all species.

The Magnitude (M, from 0-10) will cause a medium impact **(5)** for the raptors and high impact for the cranes and flamingos and pelicans **(8)**, particularly as they are already killed by the power lines here.

The Probability of occurrence (P, 1-5) of the raptors (both harriers, both falcons and the Martial Eagle) occurring and hitting or being displaced by the line relatively low **(2)**, but for flamingos, cranes and pelicans the probability of collision is ranked very highly because of their numbers in the proposed lines and their propensity to hit overhead power lines **(5)**.

The Significance S, [calculated as $S = (E+D+M)P$], is as follows for the species identified as at risk:

Blue Crane $S = (3 + 5 + 8)5 = \mathbf{80}$

Pelican $S = (3 + 5 + 8)5 = \mathbf{80}$

Both flamingo species: $S = (3 + 5 + 8)5 = \mathbf{80}$

Both Harrier species: $S = (3 + 5 + 5)5 = \mathbf{65}$

(+all other collision-prone raptors)

From these ratings we can see that for 3 of the 4 groups of collision-prone species, the significance weightings (80, 80 and 80) suggests that the impacts on these species will be sufficient to have a direct influence on the decision to develop the line area; and strong mitigation is required. Moreover these high ratings > 60 have a direct influence on the decision to develop at all and must be re-considered.

Table 2. A summary of the quantified impacts to the four main groups of species likely to be impacted by the power lines.

Nature:		
Direct impact mortality (or avoidance of area) around the new power lines for the bird groups identified as at risk above (Flamingos = Flam, Raptors = Rap, Blue Crane = Cran, Pelican = Pel): a comparison of the two alternatives		
Proposed line running alongside the existing lines		With mitigation
Extent (E)	3	3
Duration (D)	5	5
Magnitude (M)	5 (Rap) 8 (Flam, Pel, Cran)	4 (Rap), 4 (Flam, Pel, Crane)
Probability (P)	5	3
Significance (E+D+M)P	65 (Rap) 80 (Flam, Cran, Pel)	36 (Rap, Flam, Pel, Crane)
Status (+ve or -ve)	Negative	Reduced -ve
Reversibility	Low	High
Irreplaceable loss of species?	Yes, both flamingos and the Blue Cranes are at risk of local extinction here and breeding/foraging harriers are at risk of displacement.	
Can impacts be mitigated?	Yes if the lines are fitted with bird diverters, as they are erected, and routed on the west-side of the existing lines past the problematic pans holding hundreds of flamingos.	

Mitigation: There are three classes of mitigation for birds and power lines: (i) re-route the lines to avoid intersecting the movements of the birds; (ii) add nocturnal/diurnal bird diverters to all existing and proposed new lines that occur within 500m of any wetland, roost site or flyway so birds see them more readily and avoid contact; and (iii) choose an alternate route or bury the lines.

Flamingos and Blue Crane congregate to roost in dams at nightfall as an anti-predator protective measure. This means that every evening they are at risk from the power lines at Slangkop as they fly in during low-light hours.

We suggest that monitoring research be undertaken twice-yearly to determine the success of the bird diverters on the new lines.

On present evidence the southern section of this line is **High Risk** because (i) it supports thousands of individuals of three red data, and collision-prone species, (ii) the red-listed species are known to be killed on the lines here, and (iii) there are many pans and dams here which will continue to attract flamingos, cranes and raptors in future and more lines will mean more avian mortality. The *existing* lines, have recently received mitigation attention (in the form of more bird diurnal diverters) from Eskom within 1 km of all the dams on the Slangkop farm.

The study visit by EWT (L. Leeuwner pers comm), to the power lines identified as causing high mortality to wetland birds, indicates that the high impact fatalities appear to have been reduced by the addition of spiral bird diverters on the earth wire in 2015. Thus the original mitigation measures to reduce further avian deaths (re-routing the new lines) can be replaced with (i) the placement of the new line adjacent to, and west of the present lines (ii) adding spiral bird diverters to the earth wires of all new lines as they go up and (iii) competent ornithologists assessing their efficiency every 6 months.

Cumulative impacts:

Threatened wetland birds such as Blue cranes and flamingos will always be attracted to pans, dams and sewage works that offer safety and foods resources. Thus all lines that cross or come close to these areas should be fitted with nocturnal /diurnal bird diverters to reduce the incidence of collisions. Nocturnal devices are recommended because both Blue Cranes and especially flamingos are nocturnally active.

There are already up to 7 power lines running through some of the areas ear-marked and another one will add to the possibility of electrocutions and collisions. It seems that clustering conductors and power lines in an area does not necessarily increase the visibility to birds and Eskom should consider other methods to reduce mortality. Cumulative impacts of the construction of a substation and the power line itself is expected to be short term and minimal.

Residual impacts:

After mitigation, direct mortality through collision or area avoidance by the species identified above may still occur and further research and mitigation for the worst sections of line will be needed. This should be monitored regularly given the high incidence of mortality suspected.

To summarize, 8 species of concern were identified that may be impacted by the proposed power lines: Blue Crane, Greater Flamingo, Lesser Flamingo, Martial Eagle, Black Harrier, African Marsh Harrier, Peregrine and Lanner Falcon. All are red-listed collision-prone species. They occur frequently at the southern end of proposed line options, and there are large numbers of them because of a plethora of dams, pans and pristine Hopefield Swartland Shale Renosterveld. The impacts are expected to be *High* based on the significance ratings given above and in-the-field mortality of 14 birds (9 red-listed) found in August 2015. An intervention to reduce the mortality by EWT-Eskom on the offending lines in 2015 appears to have been successful (L Leeuwner, EWT), thus the new line can be routed alongside and west of the existing lines, with spirals on the earth wires of all new lines.

References

Simmons RE, Martin M. 2015. Rheboksfontein –Aurora power line alternatives 1A-E. Basic Assessment Report to Savannah Environmental.

Dr R.E. Simmons

Birds-and-bats-unlimited.com

8 Sept 2016