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Project: Study of Costs of Wildlife Interactions with Electrical Infrastructure



Project Objective:

- Determine the direct costs associated with wildlife interactions with electrical distribution infrastructure in South Africa
- Limited to direct costs of wildlife interactions – indirect costs to the South African economy (e.g. costs of lost agricultural / industrial / mining production, loss of endangered / vulnerable species) to be investigated in future research phases
- Limited to electricity distribution infrastructure – highest volume of wildlife incidents; too few incidents involving transmission infrastructure to be considered material to study



Cost Factors Included in Study

- Direct personnel costs of incident investigation & immediate remedial actions
- Transportation & other direct costs of incident investigation & remedial actions
- Direct personnel costs of mitigation activities (if applicable)
- Infrastructure / equipment cost of mitigation activities (if applicable)
- Cost of lost revenue – supply interruptions due to wildlife incidents & mitigation activities
- Assumptions regarding costs factors – based on experience & international best practice



Methodology & Data Set

- Data set of electricity supply interruptions in area(s) of high wildlife activity
- Data set filtered to exclude incidents arising from weather / non-wildlife causes
- Incident sample extracted from data set via random sampling methodology
- In-depth investigation into cost factors for sample incidents



Preliminary Observations

High-level analysis suggests

- Significant direct costs arising from wildlife incidents
- Net cost savings from wildlife mitigation measures
- Payback periods generally shorter than lifespan of mitigation measures
- Scope of savings will be quantified as precisely as possible



Areas for Further Study

- Indirect / broader economic costs of wildlife interactions – e.g. lost agricultural / industrial / mining production
- Natural Capital costs of wildlife incidents - loss of endangered / vulnerable species
- Cost of wildlife interactions with generation / transmission infrastructure (if these become material e.g. through growth in wind generation capacity)



Actual cost estimate annually :

Wildlife and electrical
infrastructure interactions are
estimated to cost the South
African utility **US\$18,444,000.00**
annually.



Pro-active Mitigation

Table 1: The total number of spans and distance recommended for mitigation for each grid identified in the pro-active mitigation plan



West Grid Pro-active Recommendation Management Plan

2017 - 2018

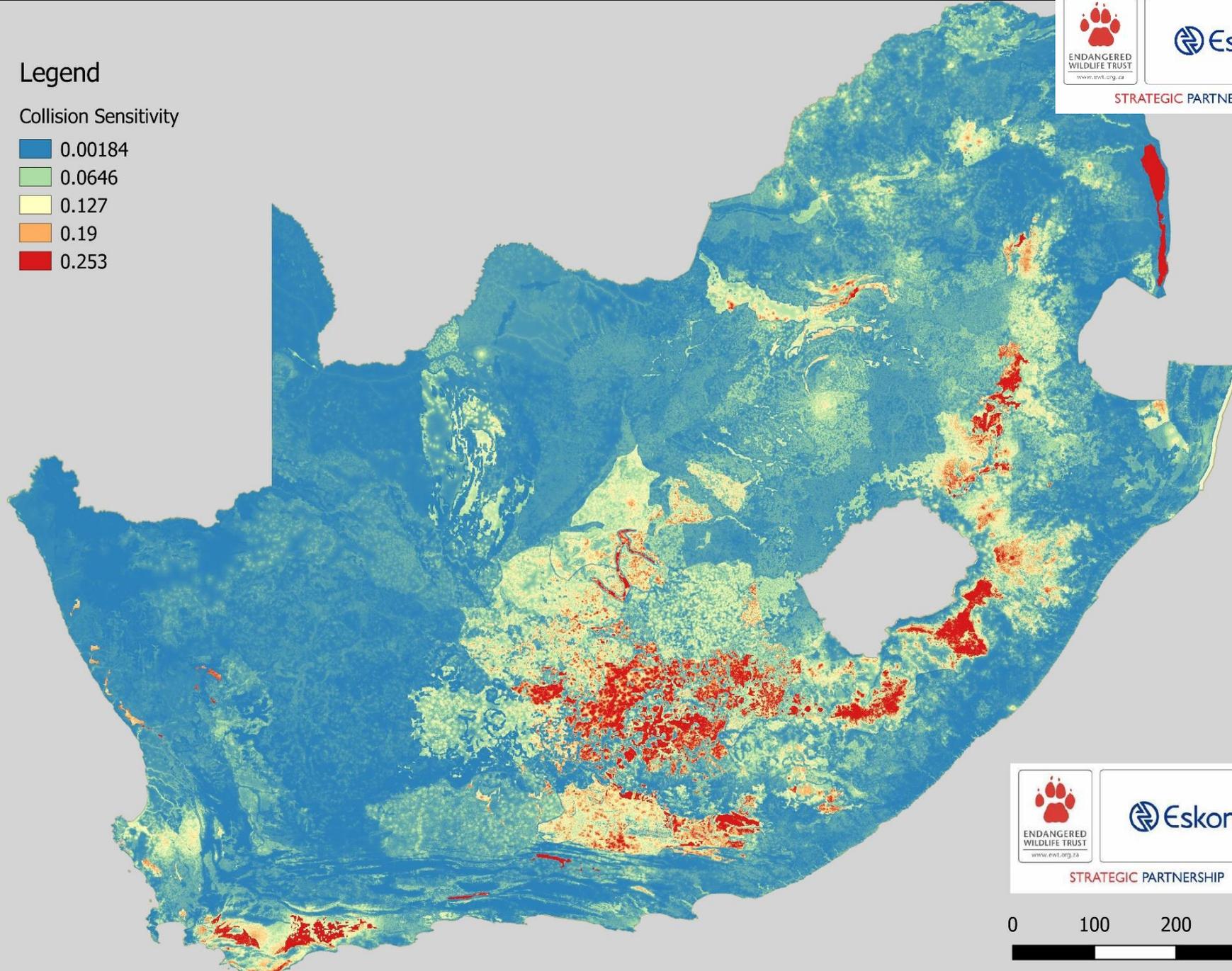


	Spans	~km
Apollo Grid	15	7.62
Central Grid	55	18.93
East Grid	717	238.7
Free State Grid	309	165.1
North East Grid	189	81.91
North Grid	61	29.1
North West Grid	252	44.94
Northern Cape Grid	445	684.91
South Grid	313	165.1
West Grid	123	52.79

Legend

Collision Sensitivity

- 0.00184
- 0.0646
- 0.127
- 0.19
- 0.253



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0 100 200 300 km

TX spans to be marked pro-actively across South Africa in most sensitive areas

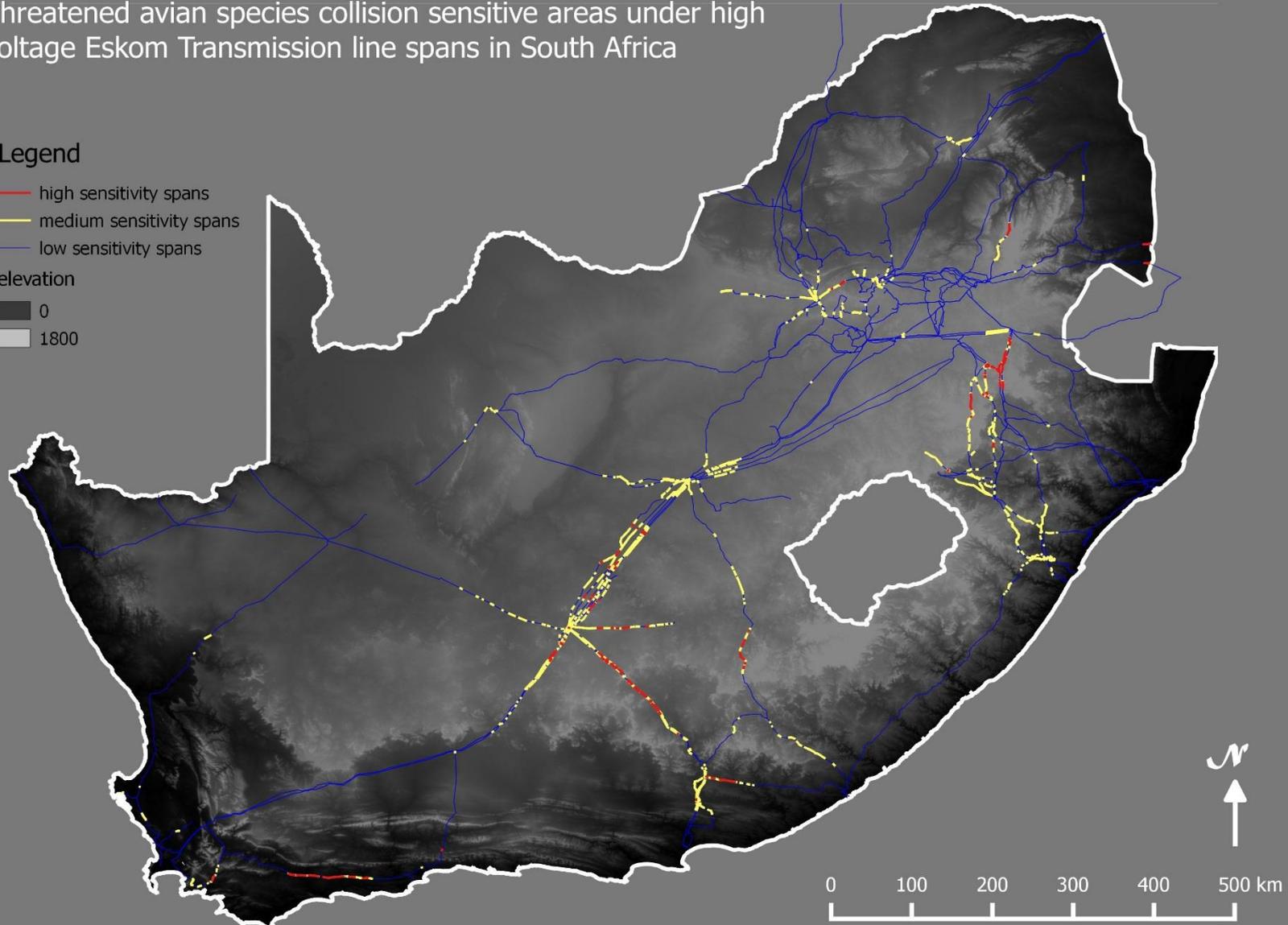
Threatened avian species collision sensitive areas under high voltage Eskom Transmission line spans in South Africa

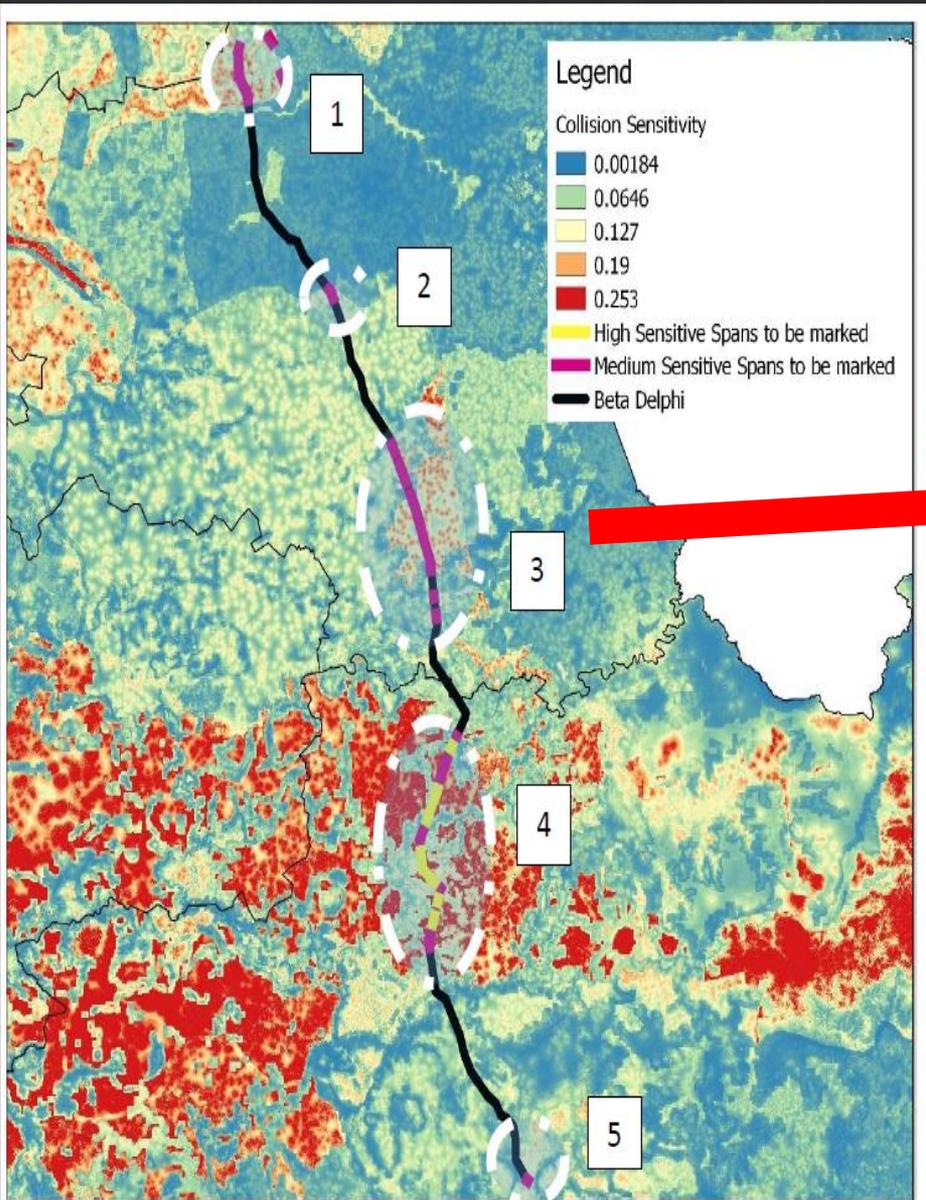
Legend

- high sensitivity spans
- medium sensitivity spans
- low sensitivity spans

elevation

- 0
- 1800





Section (Figure 4)	Towers	Approximate number of Spans	Total Distance
1	1- 36	35	19 km
2	184-190	6	3.2km
3	329 - 379	50	28 km
4	510 - 663	152	80 km
5	849-850	1	0.4 km

Prioritization of high risk areas

Figure 4: Sections of the Beta Delphi line which should have bird flight diverters fitted. This line is scheduled for maintenance between April 2017 and March 2018.

- DX and TX sensitivity maps we took the over 600 000 km of power line in SA and eliminated 95 % of lines to be made bird friendly. In Eskom DX 522 of 15094 pentads in the country were selected as high sensitivity which equates to 3% of the DX lines in SA. Eskom TX had 521 km of over 34 000 km in the country was identified as high sensitivity which equates to 2 % of the TX lines in SA. The project enabled us to identify sections of line for pro-active mitigation saving the company millions.



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THANK – YOU!

Eskom – EWT Strategic Partnership

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