



# EGI SEA: Avifauana Assessment Results

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environmental affairs  
Department:  
Environmental Affairs  
REPUBLIC OF SOUTH AFRICA



**SANBI**   
Biodiversity for Life  
South African National Biodiversity Institute

# Methodology

- The Southern African Bird Atlas 2 (SABAP2) data was obtained from the Animal Demography Unit at the University of Cape Town for each pentad in each corridor.
- Each pentad is approximately 8km × 7.6 km.
- Due to the large number of pentads (n = 7974), the pentads were consolidated into Quarter Degree Grid Cells (QDGC) (25km × 27.4km).
- Consolidated species list was compiled for each biome in each corridor by pooling all the data for the QDGCs which overlapped with a specific biome within a corridor



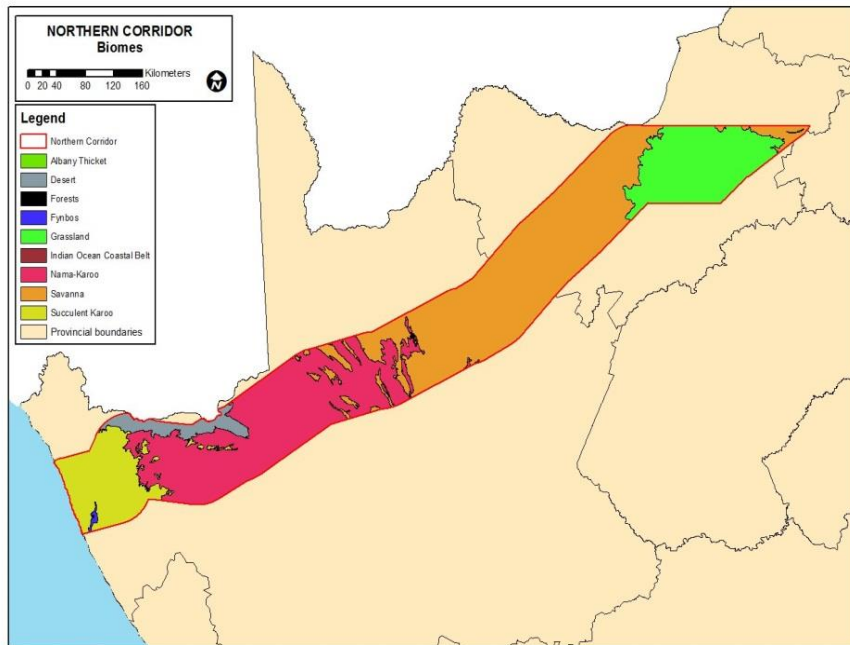
The list of avifaunal species was refined to a list of power line sensitive Red Data priority species for each biome within each corridor. The list was compiled by using the following criteria:

- Electrocutation and collision: Morphology, behaviour, habitat, historical records;
- Displacement of breeding individuals: Habitat
- *SABAP2 reporting rate: A reporting rate of 5% or higher for the species in the biome.*





# Species List: Northern Corridor Example



- Fynbos (2 QDGCs): Lanner Falcon, Lesser Flamingo, Ludwig's Bustard, Martial Eagle, Secretarybird.
- Desert (17 QDGCs): Black Stork, Karoo Korhaan, Kori Bustard, Lanner Falcon, Ludwig's Bustard, Verreaux's Eagle.
- Succulent Karoo (39 QDGCs): Black Harrier, Black Stork, Caspian Tern, Great White Pelican, Greater Flamingo, Karoo Korhaan, Kori Bustard, Lanner Falcon, Lesser Flamingo, Ludwig's Bustard, Martial Eagle, Secretarybird, Verreaux's Eagle.
- Nama Karoo (86 QDGCs): Abdim's Stork, Black Harrier, Black Stork, Karoo Korhaan, Kori Bustard, Lanner Falcon, Lappet-faced Vulture, Ludwig's Bustard, Martial Eagle, Secretarybird, Tawny Eagle, Verreaux's Eagle, Yellow-billed Stork.
- Savanna (119 QDGCs): Abdim's Stork, Black Harrier, Black Stork, Blue Crane, Cape Vulture, Great White Pelican, Greater Flamingo, Karoo Korhaan, Kori Bustard, Lanner Falcon, Lappet-faced Vulture, Lesser Flamingo, Ludwig's Bustard, Marabou Stork, Martial Eagle, Pink-backed Pelican, Secretarybird, Tawny Eagle, Verreaux's Eagle, Yellow-billed Stork.
- Grassland (37 QDGCs): Abdim's Stork, African Grass-Owl, African Marsh-Harrier, Black Stork, Blue Crane, Cape Vulture, Caspian Tern, Great White Pelican, Greater Flamingo, Lanner Falcon, Lappet-faced Vulture, Lesser Flamingo, Martial Eagle, Pink-backed Pelican, Secretarybird, Verreaux's Eagle, Yellow-billed Stork.



# Habitat and Sensitivity

- The basic point of departure for the definition of avifaunal feature sensitivity classes (habitat classes) was the 2013 - 2014 South African National Land-Cover Dataset.
- This was supplemented with information on specific features (sensitivity features) where available:
  - Biome maps of South Africa obtained from the 2011 reprint of The Vegetation of South Africa, Lesotho and Swaziland by Mucina and Rutherford;
  - The crane and vulture nest databases of the Endangered Wildlife Trust (EWT);
  - The Vulpro national vulture restaurant database
  - The Endangered Wildlife Trust's database of eagles nesting on transmission lines in the Karoo (2006);
  - The Vulpro register of Cape Vulture colonies (2015);



# Impacts

- The sensitivity of a habitat or site was determined by assessing the potential negative impacts of electricity grid infrastructure on power line sensitive Red Data priority species likely to occur in that habitat or site. Potential impact assessed according to three criteria:
  - Electrocutions on bird-unfriendly structures;
  - Collisions with the conductors of reticulation lines, and the earth-wire of transmission and sub-transmission lines; and
  - Displacement of breeding individuals through construction activity and habitat destruction.



# Impacts

- Probabilities for the respective impacts occurring were rated according to the below scale :
  - 0 = the impact is highly unlikely to occur
  - 1 = the impact is unlikely to occur
  - 2 = the impact could possibly occur
  - 3 = the impact will most likely occur





# Species Specific Probability Score

- The probability of the respective impacts occurring in a habitat class was rated for each priority species to arrive at a **species-specific probability score** for each species, for each impact, within each habitat class, within each biome, within each corridor.





# Species Specific Habitat Sensitivity Score

- The species specific probability score was then multiplied by a weighted Red Data status score for each priority species to arrive at a **species-specific habitat sensitivity score** for each species for each habitat class.
- The Red Data status were assigned weighted scores according to the below scale:
  - Near threatened = 2
  - Vulnerable = 4
  - Endangered = 8
  - Critically endangered = 16



# Habitat Sensitivity Score

- Finally, a **habitat sensitivity score** for each habitat class within a corridor was calculated by adding together all the species-specific habitat sensitivity scores in a specific habitat class.





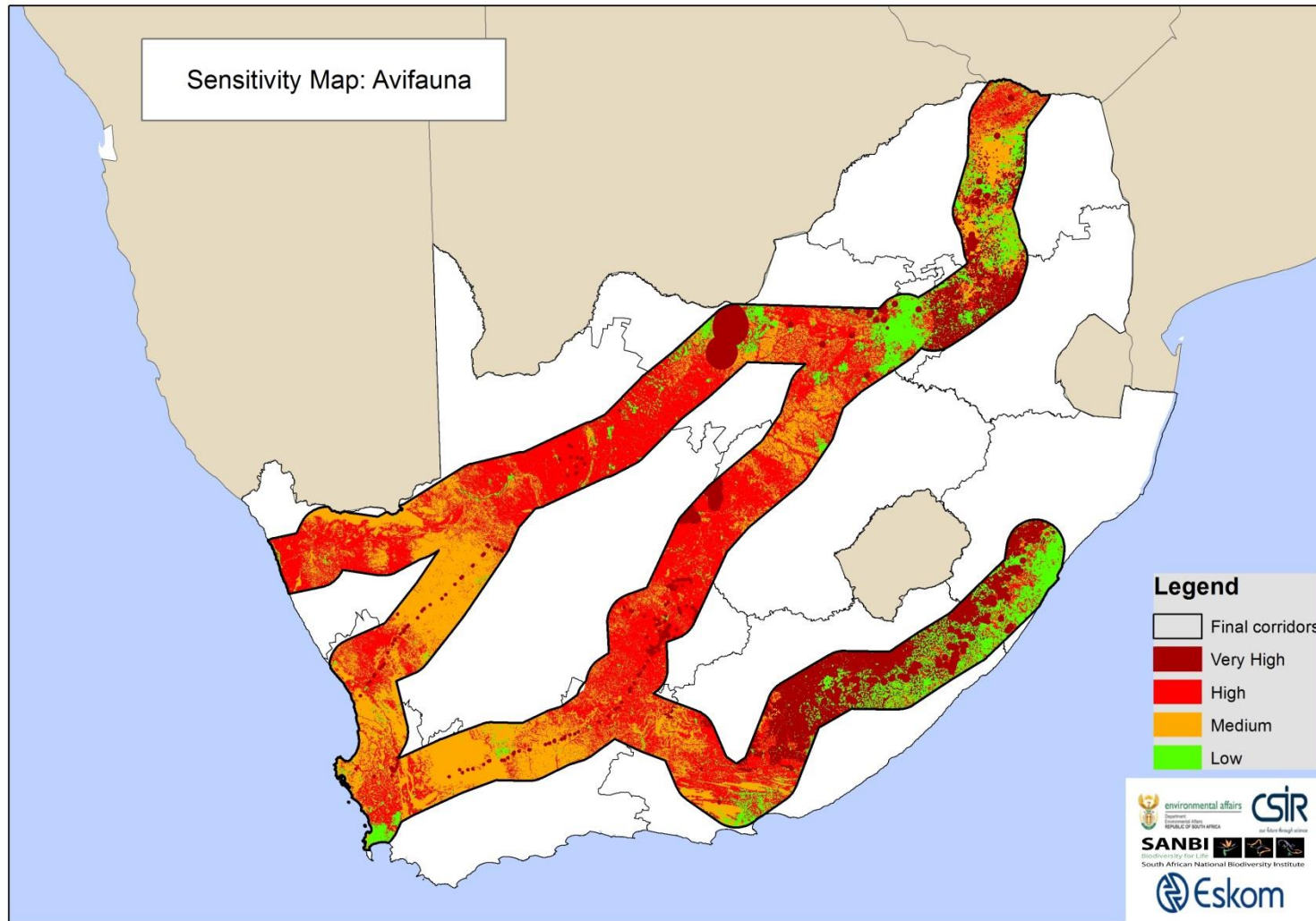
# Sensitivity Map

- A four-tiered consolidated sensitivity map of all habitat classes indicating their spatial extent in each of the corridors was developed with GIS, using the habitat sensitivity scores of the various habitat classes.
- Feature sensitivity score range
  - 0 =Low
  - 1 – 80 =Medium
  - 81 – 160 =High
  - 161 – 240 =Very High
- The sensitivity ratings were illustrated according to the following classification scheme: Dark Red/Very High, Red/High, Orange/Medium, Green/Low.

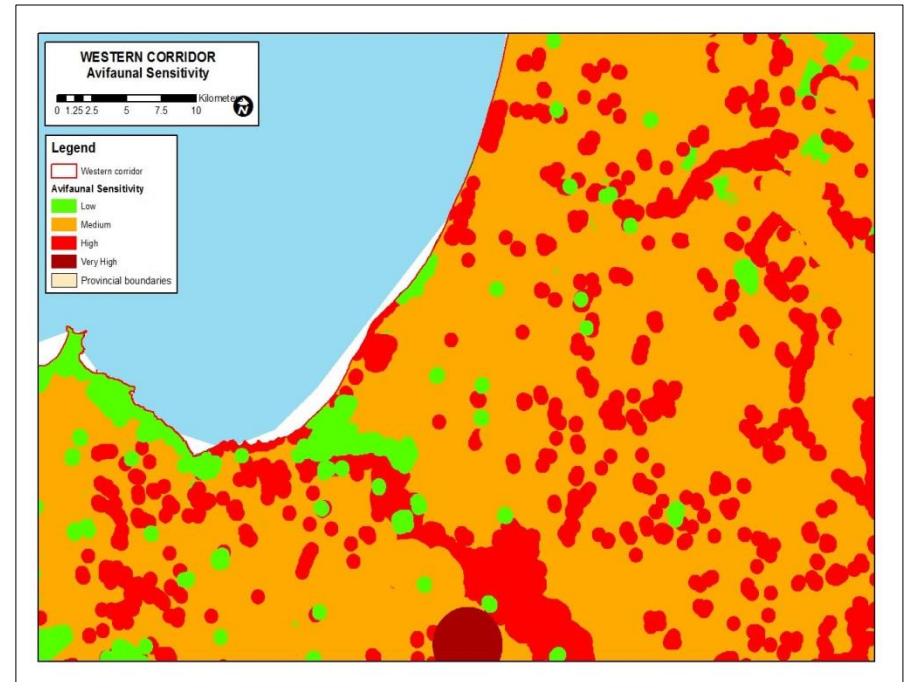
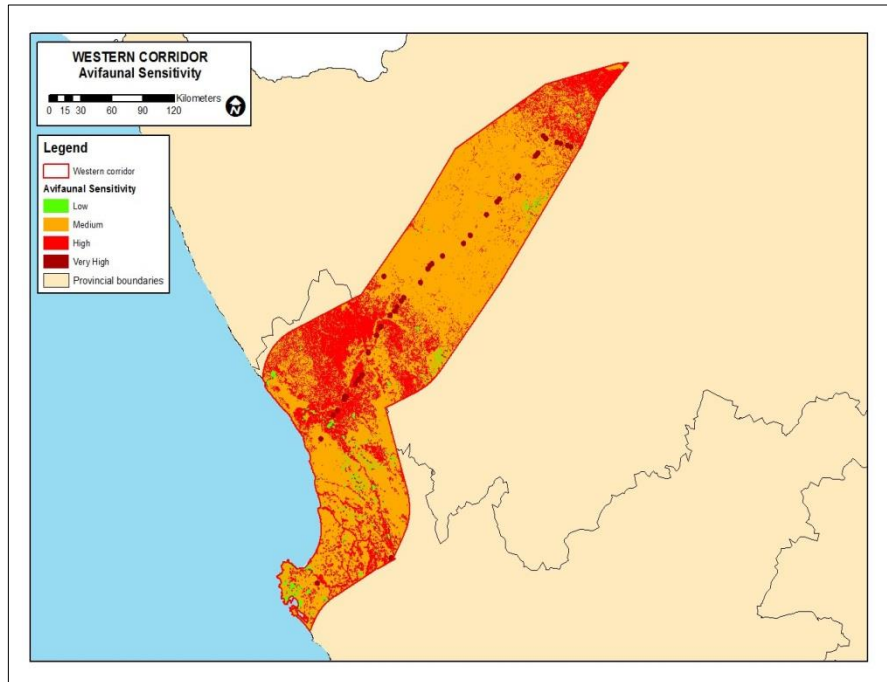




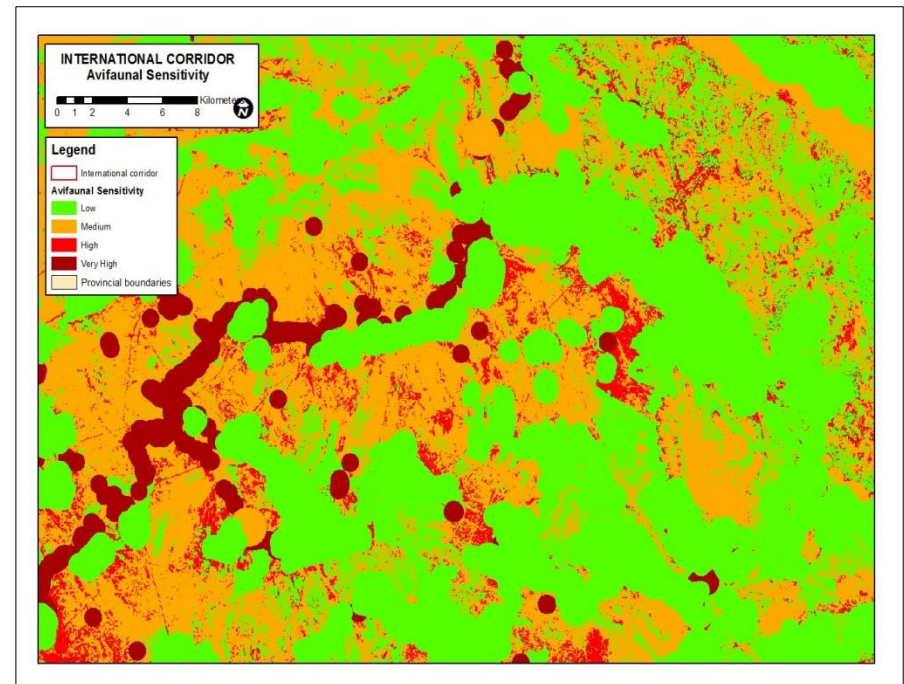
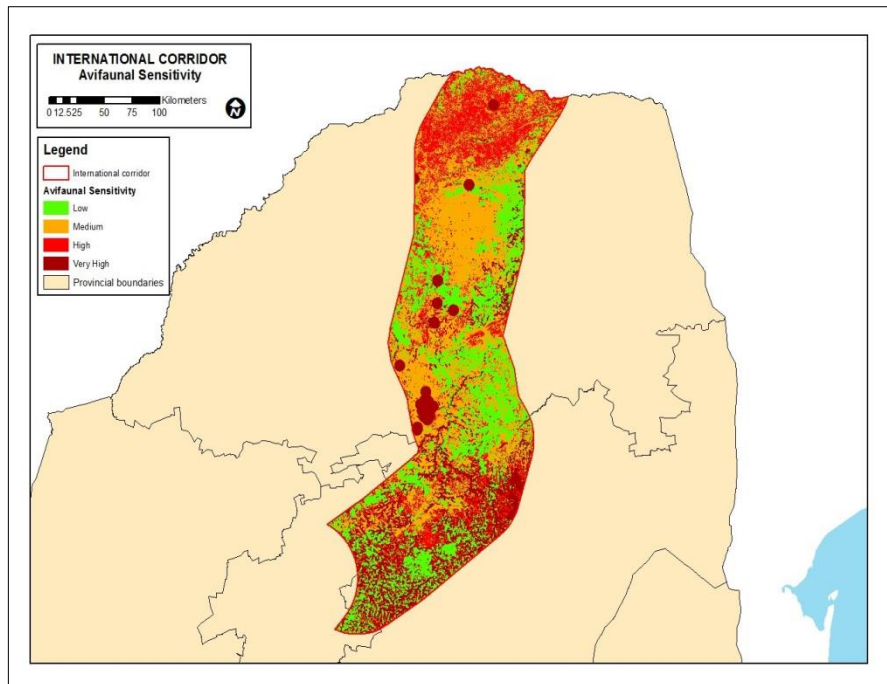
# Sensitivity Map: All Corridors



# Western Corridor



# International Corridor



# Additional Assessment Requirements

- Recommendations were compiled for each corridor based on what additional assessments would need to be undertaken in each of the sensitivity classes which was then incorporated into an avifaunal development protocol for that sensitivity class.
- Key sensitivity features (e.g. vulture breeding areas, eagle nests, vulture restaurants, crane nests and Blue Swallow breeding areas) were buffered and allocated a default Dark Red/Very High sensitivity rating.



# Avifaunal Protocol

Sensitivity Class	Interpretation	Implementation and additional assessments at project level	Permit requirements (if any)
<b>Very High</b>	Very High sensitivity areas known to support important populations of threatened, impact susceptible species. Potentially unsuited to development owing to their high avifaunal importance	Development in these areas is discouraged. The onus is on any would-be developer to provide sound, empirical evidence of effective mitigation in spite of the impact sensitivities identified. Qualitative and quantitative field surveys should be collected, and include sample counts representative of high risk environmental conditions likely to occur on each site. If need be, additional research by a suitably experienced avifaunal specialist, is required to obtain a sufficient understanding of the avifaunal impacts and potential effectiveness of the proposed mitigation measures.	BLSA and the Endangered Wildlife Trust should be notified of any development proposals
<b>High</b>	High sensitivity areas likely to support important populations of threatened, impact susceptible species. Potentially unsuited for development unless sensitivities are fully investigated and impacts can be sufficiently mitigated.	Development in these areas may take place, provided sound, empirical evidence of effective mitigation is provided. Qualitative field surveys by a suitably experienced avifaunal specialist are required to obtain a sufficient understanding of the avifaunal impacts and potential effectiveness of the proposed mitigation measures.	BLSA and the Endangered Wildlife Trust should be notified of any development proposals
<b>Medium</b>	Medium sensitivity areas that could support important populations of threatened, impact susceptible species. Possibly suitable for development, but potential sensitivities must be fully investigated and effective mitigation options clearly identified.	Development in these areas may take place, provided sound, empirical evidence of effective mitigation is provided. Limited, qualitative field surveys by a suitably experienced avifaunal specialist may be required to obtain a sufficient understanding of the avifaunal impacts and potential effectiveness of the proposed mitigation measures. In the case of a substation development, field surveys will not be required unless the desk top assessment indicate the need for an on-site survey.	If the development overlaps with an IBA, BLSA and the Endangered Wildlife Trust should be notified of any development proposals
<b>Low</b>	Lower sensitivity areas that probably don't support important populations of threatened, impact susceptible species. Probably suitable for development, with no anticipated unsustainable impacts on birds.	Development in these areas may take place. A desk-top level assessment by a suitably experienced avifaunal specialist is required. Additional, qualitative field surveys will only be required if specific avifaunal sensitivities are identified by the desk-top study.	If the development overlaps with an IBA, BLSA and the Endangered Wildlife Trust should be notified of any development proposals

# Mitigation

Corridor	Key Impacts	Site Specific Descriptions	Possible Effect	Mitigation
International Corridor	<ul style="list-style-type: none"> <li>Mortality of power line sensitive Red Data species through collisions</li> <li>Mortality of power line sensitive Red Data species through electrocutions</li> <li>Displacement of Red Data species</li> </ul>	African Grass-Owl collisions at wetlands in Grassland.	Multiple casualties could destabilise the population.	Avoid routing power lines within 500m of waterbodies found to be suitable for the species, and if unavoidable, mark power lines at waterbodies with nocturnal light emitting diode (LED) mitigation devices.
		Blue Crane collisions at wetlands in Grassland. Displacement of breeding birds in Grassland.	Multiple casualties could destabilise the population.	Avoid routing power lines within 500m of waterbodies found to be suitable for the species, and if unavoidable, mark power lines at waterbodies with nocturnal light emitting diode (LED) mitigation devices. Buffer all nests by 2.5km. Should the full extent of the buffering not be practically possible it would require management of the potential impacts on the breeding birds once construction commences, which would necessitate the involvement of the avifaunal specialist and the Environmental Control Officer. An effective communication strategy should be implemented whereby the avifaunal specialist is provided with a construction schedule which will enable him/her to ascertain if, when and where breeding birds could be impacted by the project.



# Thank you

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