

**Eskom Management Systems
to avoid or mitigate the
Biodiversity impacts
of Wind energy projects**

**Rudi Kruger
Corporate Specialist
Eskom
South Africa**

4 May 2012

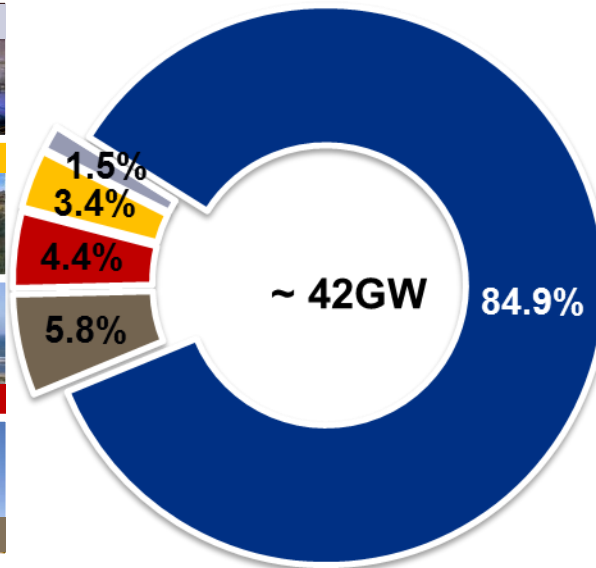


- How wildlife interactions became an integral part of Eskom's business
 - Overview of the Eskom/ Endangered Wildlife Trust Strategic Partnership
- Eskom Policies and governance structures to mitigate biodiversity impacts
- Engagements with Birdlife South Africa
- Wind energy projects
 - Tools to avoid or mitigate biodiversity impacts

Profile of Eskom

- **State-owned (Department of Public Enterprises)**
- **Separate legal entity**
- **Generates 95% of South Africa's electricity (~45% Africa)**
- **Employs over 41 778 staff**
- **Generation – 26 power stations, total installed capacity of 44 175 MW**
- **395,416 kilometres of power lines of all voltages**

Eskom's Net Maximum Generating Capacity Mix – 31 March 2012



Wildlife interactions with electrical infrastructure - from 1995 to now...



Formation of the Eskom/EWT Strategic Partnership

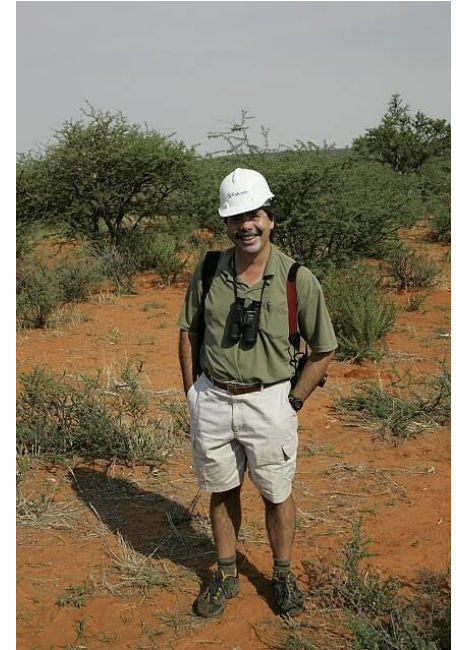
- After numerous vultures were electrocuted during 1995 on an 88 kV powerline, studies revealed that bird mortalities on the Eskom electricity networks were much higher than originally envisaged.
- Eskom had an informal alliance with the Endangered Wildlife Trust (EWT), an environmental non-government organisation focusing on promoting the region's biodiversity.
- Eskom and EWT formalised their long-standing relationship by entering into a formal partnership at the end of 1995 to address the problem in a systematic manner on a national basis.
- Through the partnership, Eskom ensures that power is supplied without significantly impacting on South Africa's wildlife. The EWT fulfills its goal of promoting the conservation of southern Africa's biodiversity. It is a situation, where Eskom, the EWT, the people of southern Africa and the environment wins.

- Developed and implemented an effective reporting system to report and identify localities of negative bird interactions with powerlines
- Developed and implementation an investigation and monitoring system for negative interactions
- Established a database on negative interactions between birds and electricity structures to facilitate retrofitting and future design and placing of electricity networks and structures
 - EWT or ex-EWT employees (now in private practice) performs specialist avifaunal impact assessment on all new Eskom powerline projects to guide route and site selection.

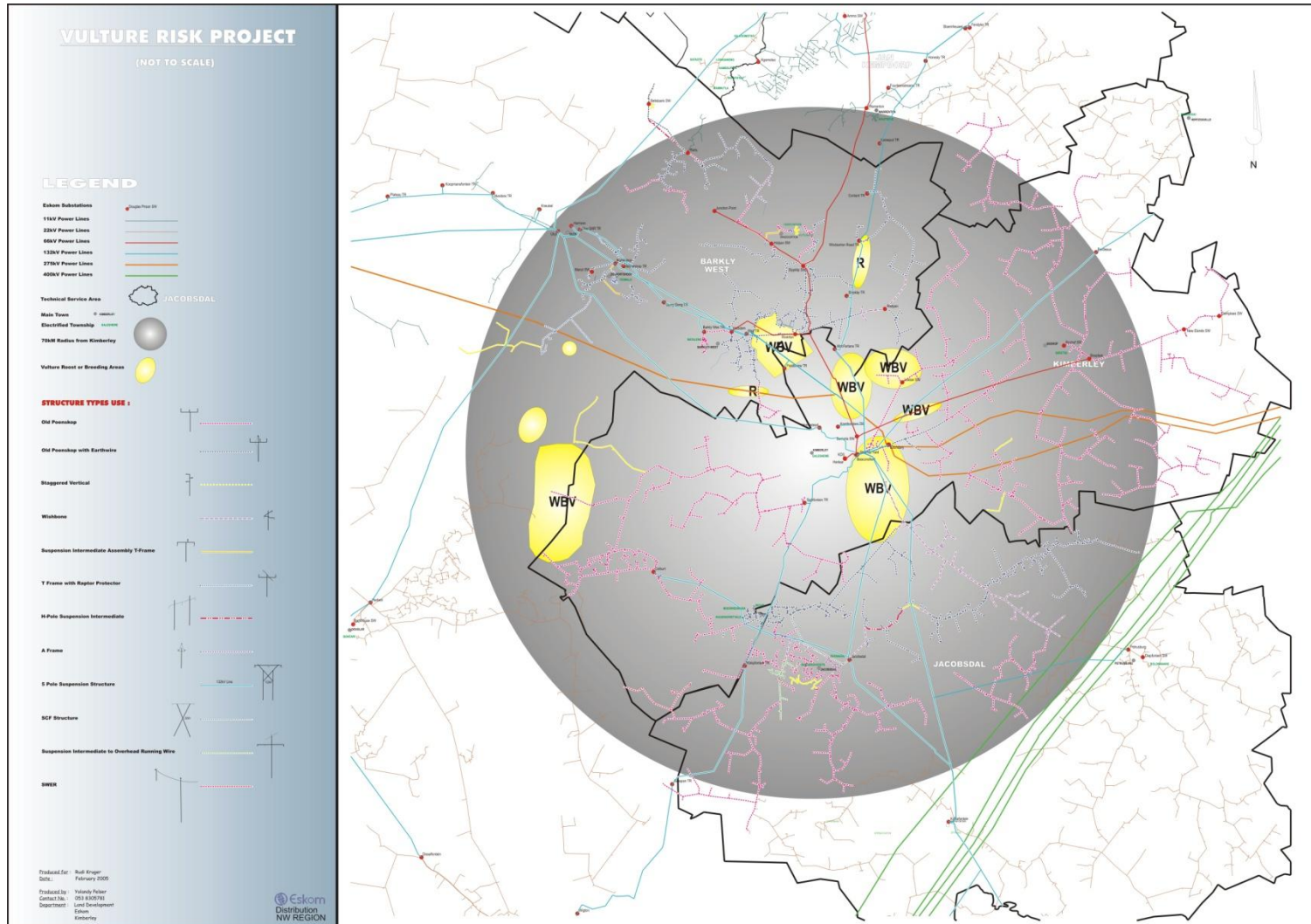
Key deliverables of the partnership

- Implemented an effective, ongoing awareness and training campaign to familiarize Eskom staff, field investigators and the general public with the partnership and wildlife interactions.
- Facilitate implementation and tracking of mitigation measures to minimise negative interactions
- Formally integrated wildlife interactions as part of the Eskom Research program.

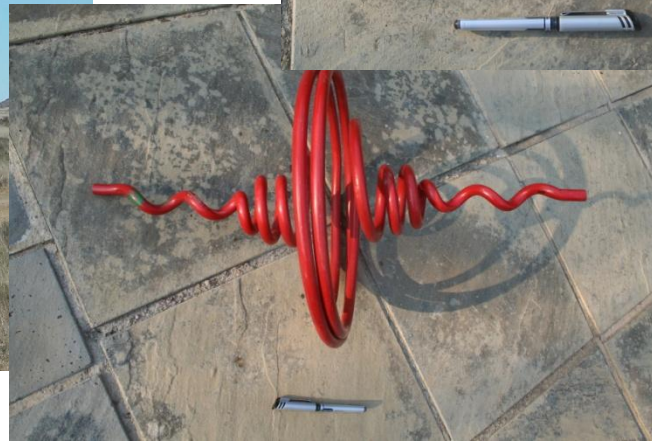
Some examples of the deliverables....



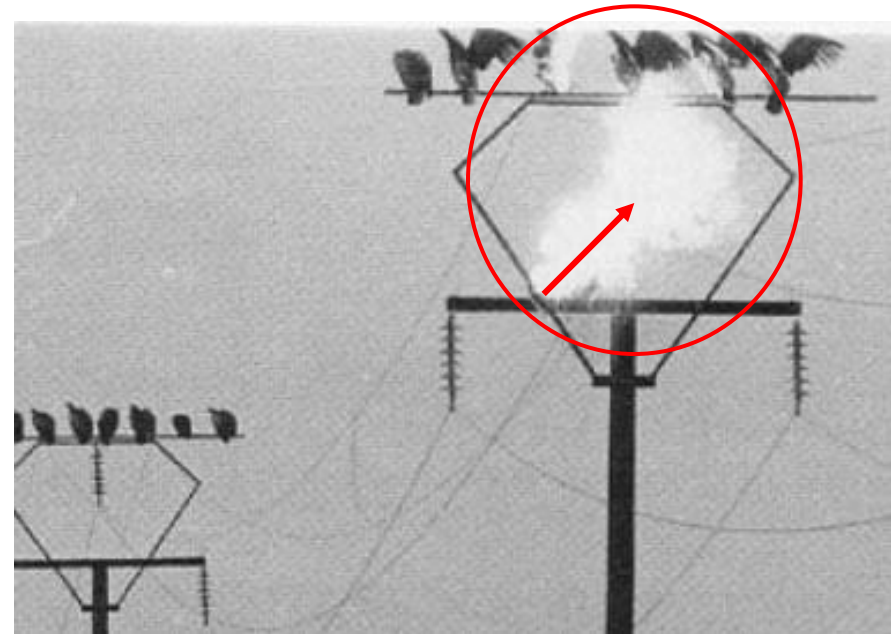
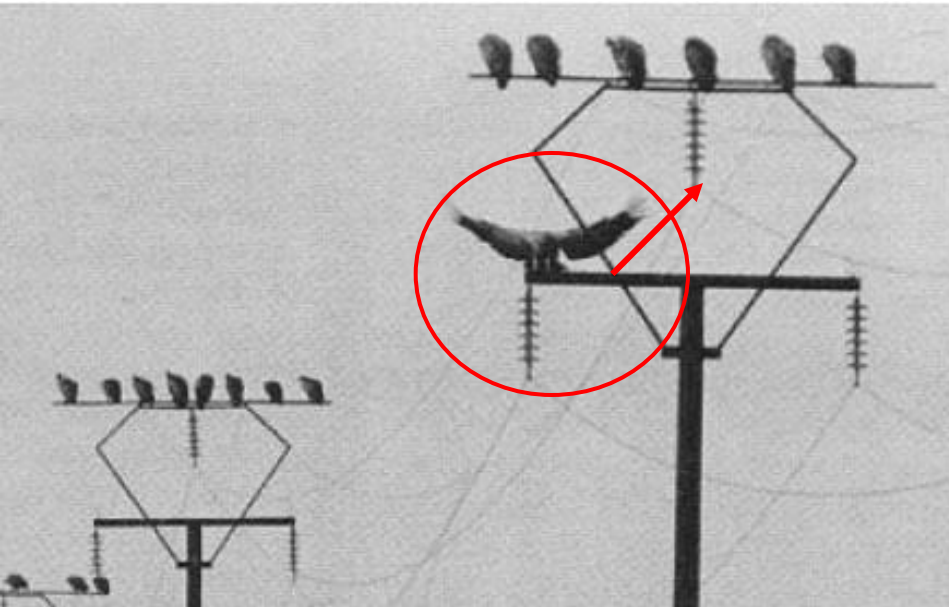
Research: Risk Assessment methodology



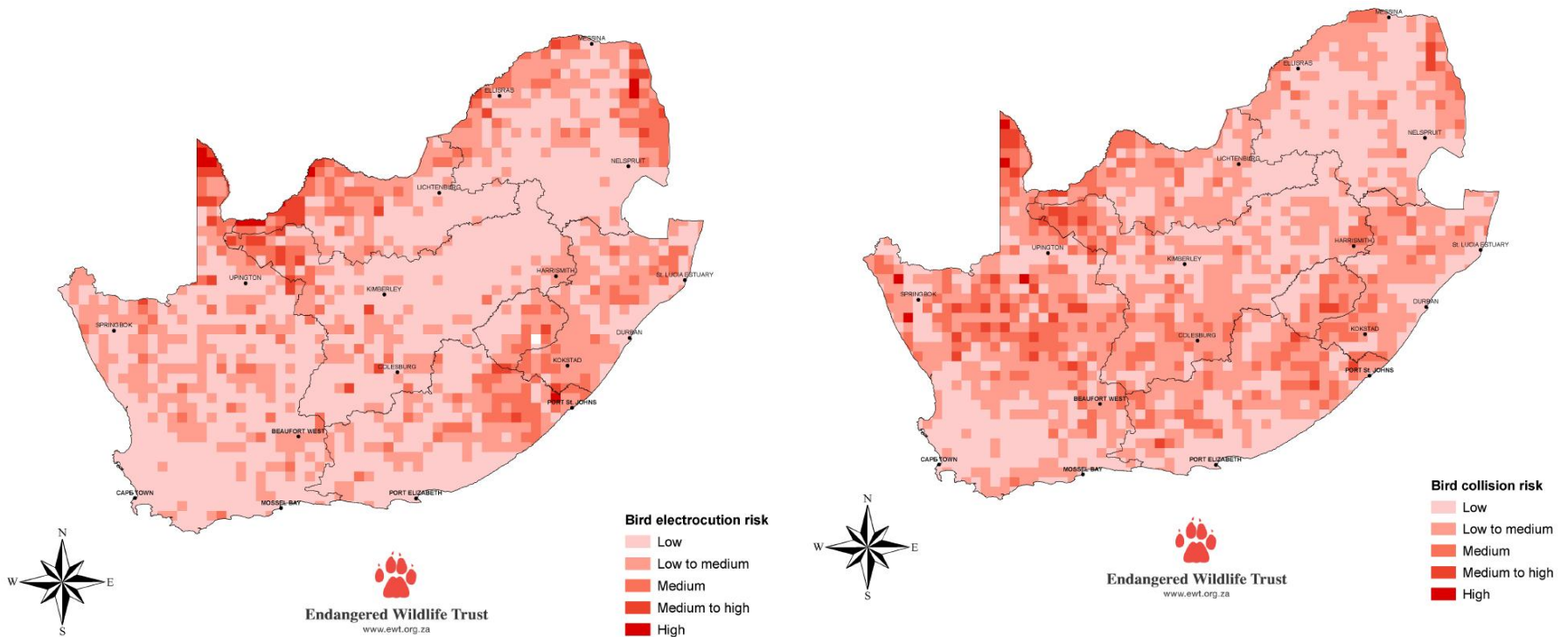
Research: Mitigation Products



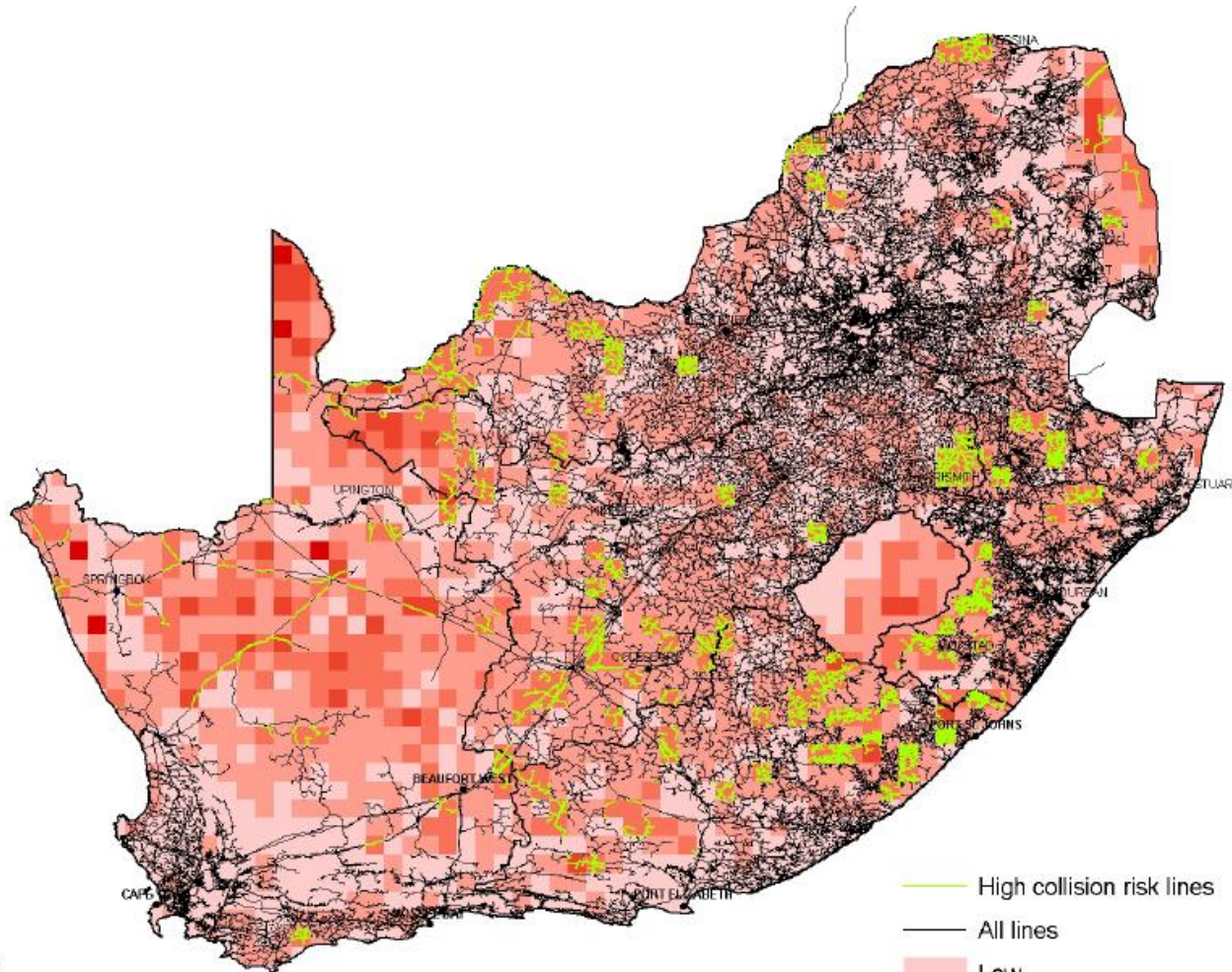
- Contact incident on Watershed-Slurry Structure



Research: Bird sensitivity maps



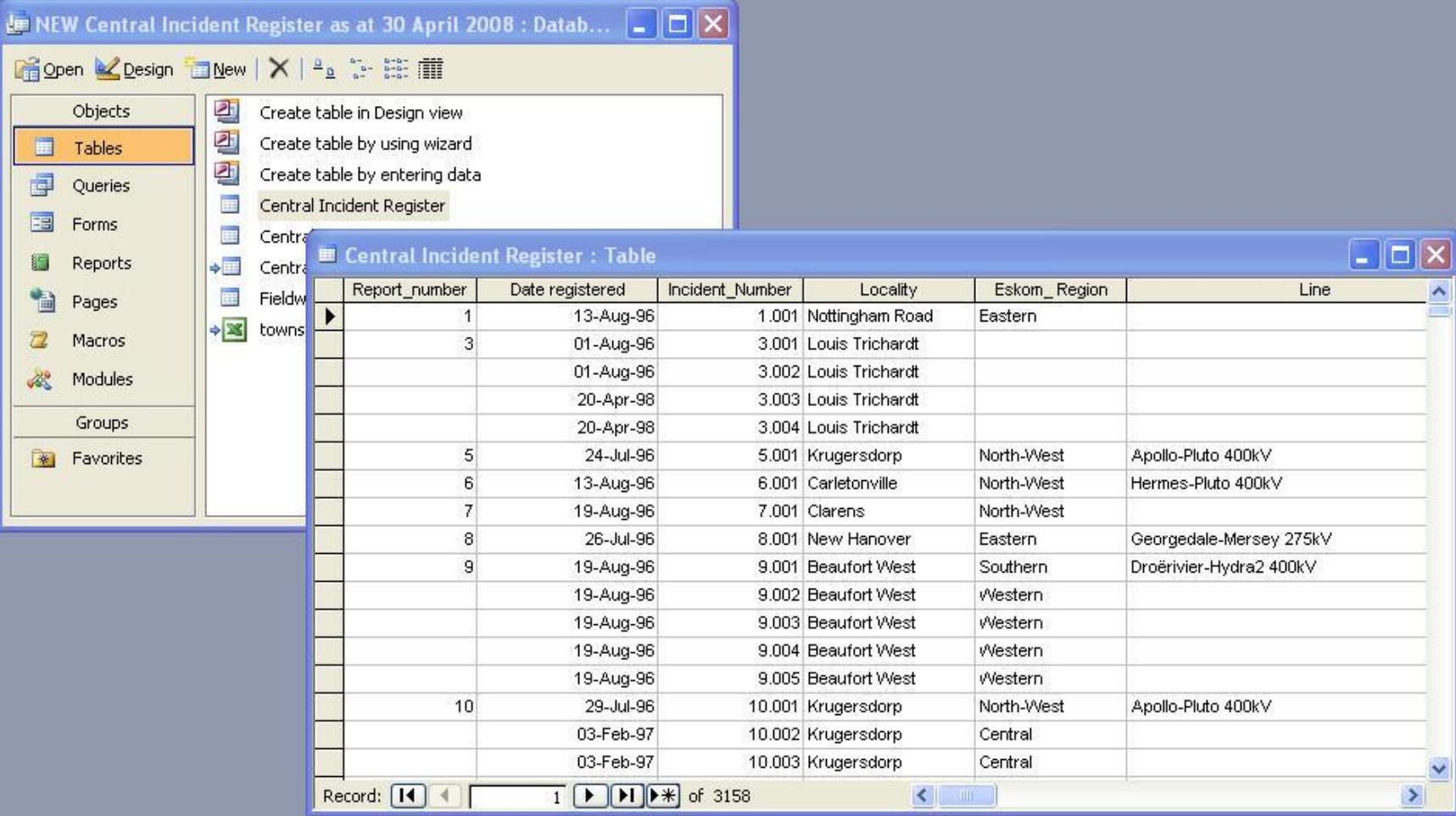
Collision risk of all powerlines



- High collision risk lines
- All lines
- Low
- Low to medium
- Medium
- Medium to high
- High



Incident register...



NEW Central Incident Register as at 30 April 2008 : Datab...

Open Design New

Objects

- Tables
- Queries
- Forms
- Reports
- Pages
- Macros
- Modules
- Groups
- Favorites

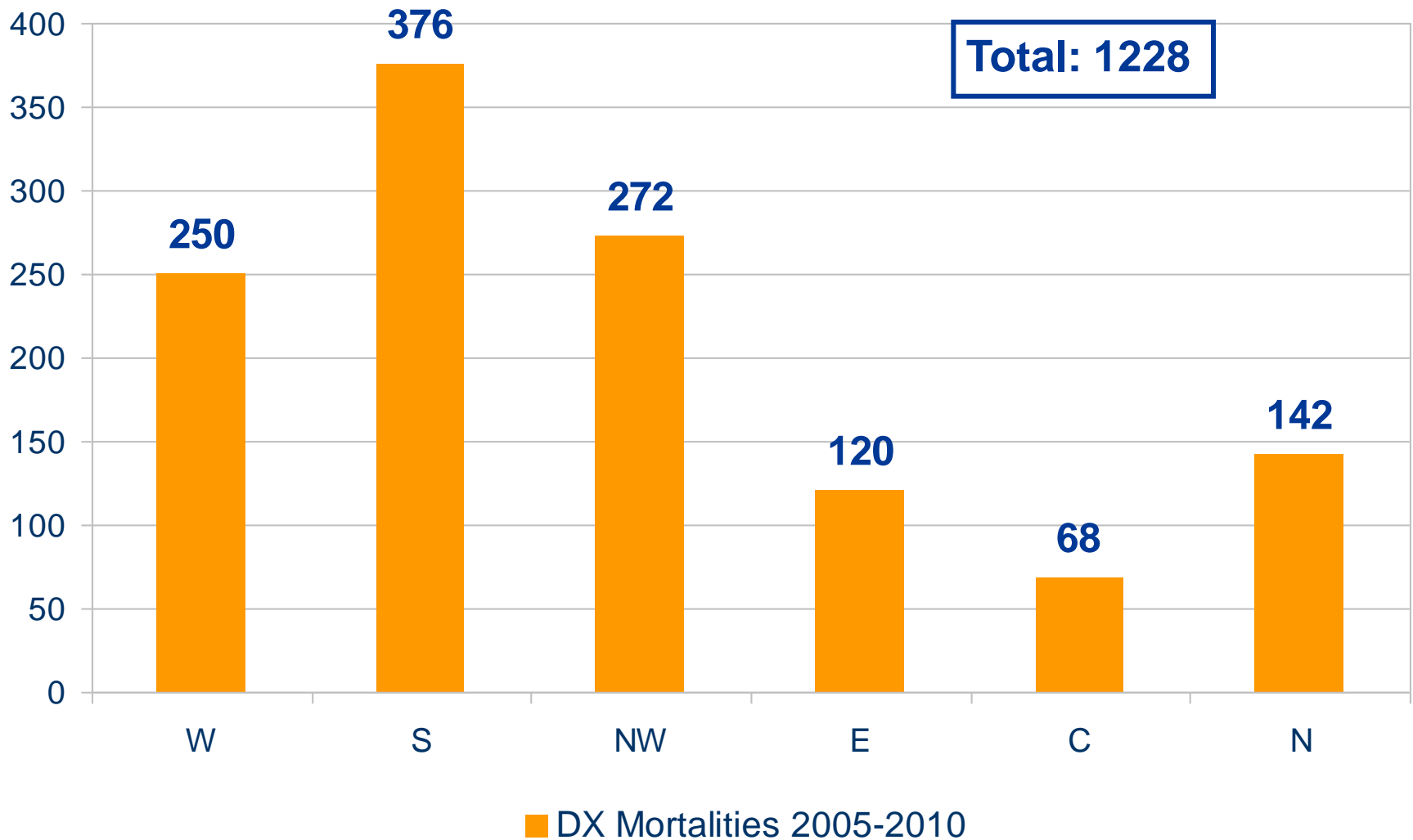
Create table in Design view
Create table by using wizard
Create table by entering data
Central Incident Register
Centra
Centra
Fieldw
towns

Central Incident Register : Table

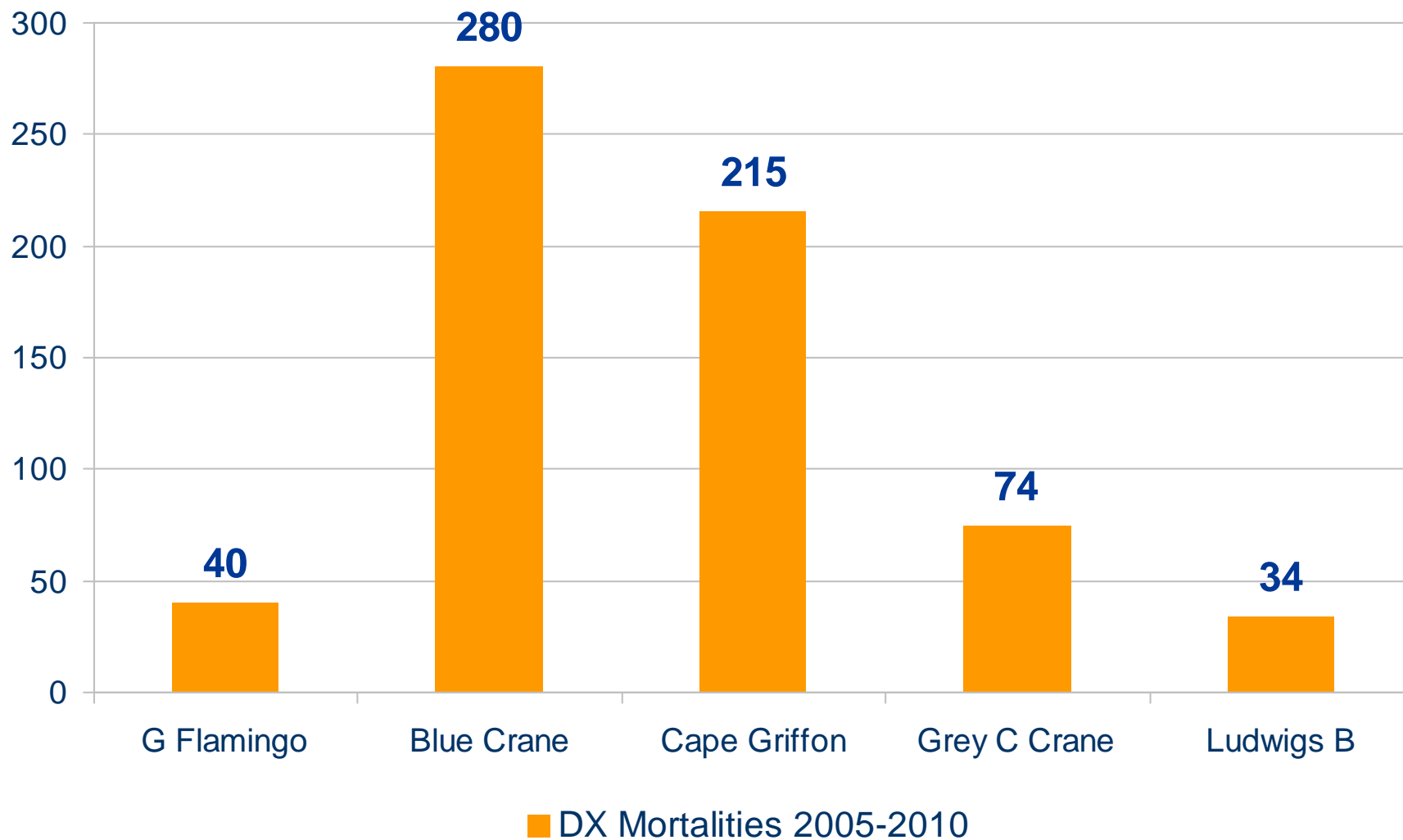
| Report_number | Date registered | Incident_Number | Locality | Eskom_Region | Line |
|---------------|-----------------|-----------------|-----------------|--------------|-------------------------|
| 1 | 13-Aug-96 | 1.001 | Nottingham Road | Eastern | |
| 3 | 01-Aug-96 | 3.001 | Louis Trichardt | | |
| | 01-Aug-96 | 3.002 | Louis Trichardt | | |
| | 20-Apr-98 | 3.003 | Louis Trichardt | | |
| | 20-Apr-98 | 3.004 | Louis Trichardt | | |
| 5 | 24-Jul-96 | 5.001 | Krugersdorp | North-West | Apollo-Pluto 400kV |
| 6 | 13-Aug-96 | 6.001 | Carletonville | North-West | Hermes-Pluto 400kV |
| 7 | 19-Aug-96 | 7.001 | Clarens | North-West | |
| 8 | 26-Jul-96 | 8.001 | New Hanover | Eastern | Georgedale-Mersey 275kV |
| 9 | 19-Aug-96 | 9.001 | Beaufort West | Southern | Droërivier-Hydra2 400kV |
| | 19-Aug-96 | 9.002 | Beaufort West | Western | |
| | 19-Aug-96 | 9.003 | Beaufort West | Western | |
| | 19-Aug-96 | 9.004 | Beaufort West | Western | |
| | 19-Aug-96 | 9.005 | Beaufort West | Western | |
| 10 | 29-Jul-96 | 10.001 | Krugersdorp | North-West | Apollo-Pluto 400kV |
| | 03-Feb-97 | 10.002 | Krugersdorp | Central | |
| | 03-Feb-97 | 10.003 | Krugersdorp | Central | |

Record: 1 of 3158

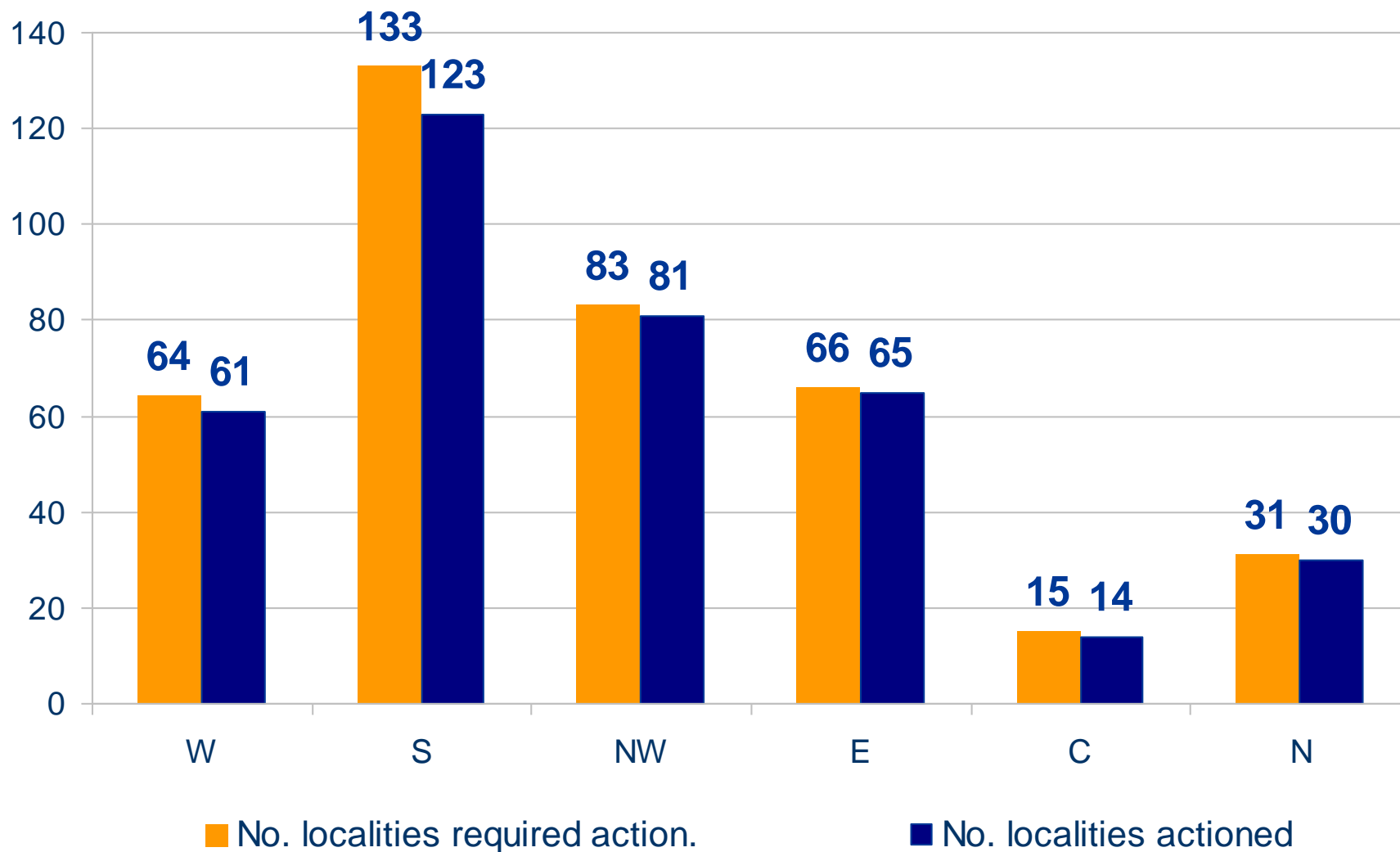
Management information extracted from incident register...



Eskom Distribution Division ($\leq 132\text{kV}$): Species mortality: 2005-2010 (reported)



Number of DX localities requiring action vs. localities actioned (2005-2010)



Other challenges...



How were these aspects and lessons learned integrated into the management systems of the current Eskom.....?

- Environmental aspects are integrated into business processes through **setting and implementing policy** and having **robust governance structures** to ensure **integrated decision-making and action**
- Reviewing performance so that we can act and **continually improve performance**

ISO 14001 ENVIRONMENTAL MANAGEMENT SYSTEMS



Eskom Land and Biodiversity Policy and Standard: Policy Statement

- Eskom shall ensure that in the planning, construction, operation and decommissioning of its activities measures are in place to limit the impact of its infrastructure, land-use and other resource uses on biodiversity and shall comply with all applicable legislation.
- Eskom's position on managing biodiversity impacts shall be based on the following sequence:
 - to avoid the impact;
 - if impact cannot be in total avoided, then to minimise and reduce the impact;
 - when an impact does occur, this must be mitigated and rehabilitated (restored); and
 - as a last resort, the option of an off-set must be considered in consultation with the Environmental Liaison Committee (ELC).

PLANNING PHASE: Feasibility studies and design (new infrastructure).

- All planning related activities to be subjected to environmental assessments, which must **take biodiversity related impacts**, bioregional and spatial planning **into consideration**.
- Not to increase the biodiversity impact within special nature reserves and national parks without an appropriate Environmental Assessment.
- **Not to build** new infrastructure **within “Important Bird Areas” (IBAs)** and or bird sensitive environments as identified through the Eskom-EWT strategic partnership, **without the prior engagement** with the appropriate environmental NGO stakeholders (**BLSA, EWT, WWF, etc.**).
- **Not to build** new infrastructure **within “Critically Endangered” biodiversity areas**, as defined within the bioregional plans (as gazetted), **without prior engagement** with the relevant stakeholders (**SANBI, Botsoc, DEA, SANParks, etc.**).
- All designs of power lines shall be wildlife friendly.
- Eskom will continue to support research in areas of biodiversity research.

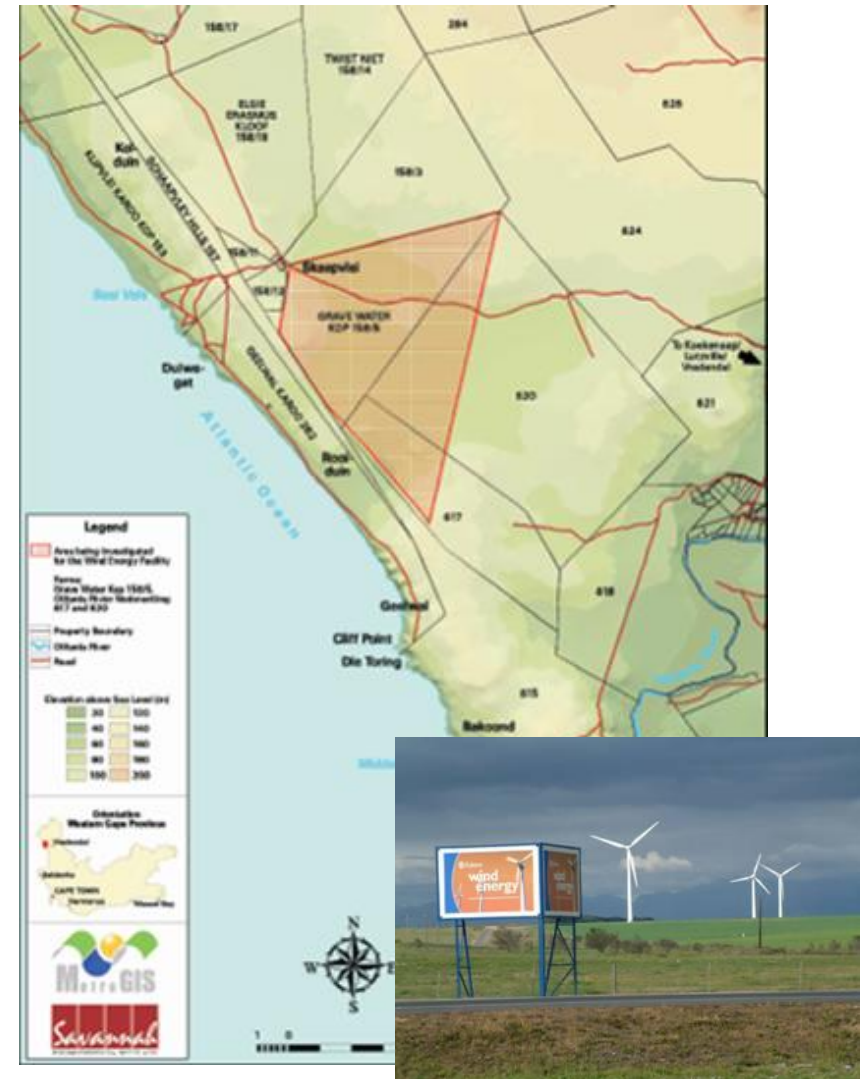
OPERATING PHASE (existing infrastructure)

- All existing infrastructure must be monitored for potential biodiversity impacts during maintenance.
- All infrastructure that has the potential to impact wildlife (electrocution and collisions) must be reported, assessed and appropriate mitigation measures must be implemented.
- All Eskom-owned and/or controlled land shall be managed through an EMP that includes biodiversity related impacts.

Eskom has a long standing relationship with BirdLife SA (BLSA)

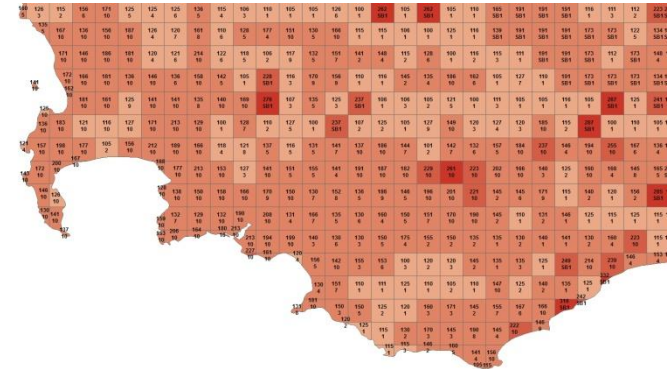
- Currently funding BLSA to update the so called *"The Eskom Red Data Book of Birds of South Africa, Lesotho and Swaziland"* publication.
- This publication is well known by all those involved in avian studies, science, protection and conservation. It shapes government policy on species protection, used in EIA studies and determining areas for protection and is both nationally and Internationally recognised scientific publication.
- Eskom is participating in The Birds & Wind Energy Specialist Group, convened by the EWT and BLSA, on proposed guidelines and monitoring protocols for evaluating wind energy development proposals in southern Africa, which is documented in *"BirdLife South Africa / Endangered Wildlife Trust best practice guidelines for avian monitoring and impact mitigation at proposed wind energy development sites in southern Africa"*.

- Demonstration plant of 3.2MW
- Projects in progress:
 - Sere 100MW
 - Kleinzee 300MW
 - Aberdeen 200MW
- All above projects followed full EIA process with specialist biodiversity assessments



Way forward: Project based approach to identify and evaluate impact of wind generation on avifauna

- Macro scale assessment of sensitive areas
e.g Using Avian Wind Farm sensitivity Map
- Micro scale assessment prior to construction
 - Observation & collection of quantitative data on bird movement on site critical
 - Seasonal representation
 - Collision risk modeling
- Standardization across projects
 - Best practice guidelines for preconstruction assessment & post construction monitoring
- Impact of associated infrastructure connecting to the grid must be part of Macro and Micro assessment (holistic approach)
- Post construction monitoring at operational sites



- Extensive body of knowledge built up over the past 16 years through the Eskom/EWT partnership
- Biodiversity considerations integrated into all phases of the Eskom project life-cycle
 - Detailed biodiversity assessments and specialist avifaunal studies conducted for all Eskom wind energy projects
 - Studies guided by bird sensitivity maps and input from ornithological experts and site specific studies
 - Above studies guide siting and route selection including that of associated infrastructure
 - Post construction monitoring formalised to report, investigate and implement mitigation measures where possible
- Formal partnership with EWT allows networking and having access to biodiversity specialists
- Networking with other NGOs like Birdlife South Africa is a critical success factor.

Acknowledgements

- Megan Diamond – Endangered Wildlife Trust
- Constant Hoogstad – Endangered Wildlife Trust
- Dave Lucas - Eskom



Thank you!