



NamPower/NNF Strategic Partnership



Update on power line monitoring and mitigation

EAPAN Mini-Conference
10 October 2014

Financed by the European Investment Bank



Project mission

The NamPower/Namibia Nature Foundation Strategic Partnership was launched in October 2008

The mission is to
address wildlife/power line interactions in Namibia



Project objectives

The objectives are to:

- Promote awareness and communication about the risks that power lines pose to birds, and birds to power lines
- Report, monitor and manage interactions between power lines and wildlife; conduct research
- Incorporate bird/wildlife mitigation into existing power line networks, and into the planning of future networks
- Develop an over-arching, easily accessible environmental information service to assist with achieving the above objectives

The project objectives are directly related to a dynamic action plan, developed and updated regularly in consultation with stakeholders.

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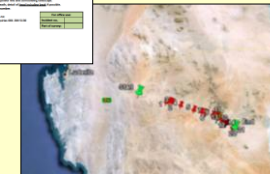
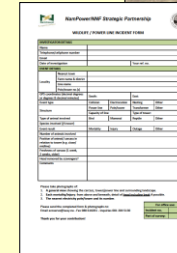
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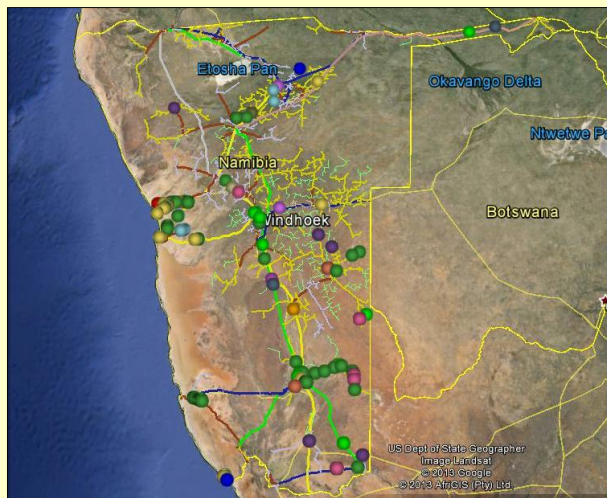
Monitoring and incident reporting

Power line surveys/ monitoring

- **Dedicated power line monitoring surveys** have been initiated, in collaboration with NamPower
- Other partners include environmental staff at mines (Namdeb, AREVA & Swakop Uranium), NACOMA, MET, Municipalities and student projects
- **Survey/incident results are entered into a database and evaluated** regularly, and recommendations are made for mitigation/ further monitoring



Wildlife and power line incidents on database (EIS 2014)



Power line surveys/ monitoring

- **Provisional results** for 230 incidents involving 280 animals (this excludes data from J Pallett's project)
- Mainly **bird species**, including **bustards (51%), flamingos (25%), raptors (16%**: various eagles, vultures, owls, Secretarybirds)
- A number of these species are **Red-listed**
- **Mammal species**: small-spotted genet, giraffe

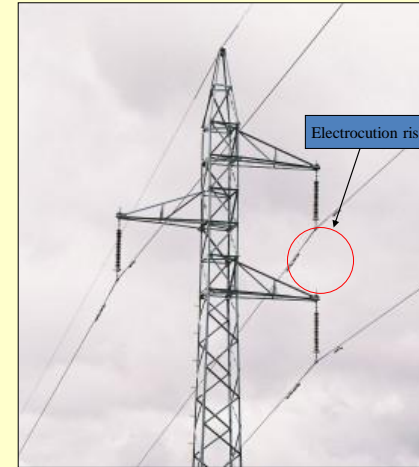


Collisions

Any structure is a collision risk - especially when structures run in parallel



Electrocutions



Mitigation measures to avoid power line incidents

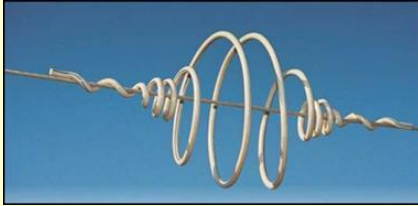
General mitigation measures

- Avoid routing the line near **avian hot-spots/ sensitive areas** (e.g. wetlands, breeding colonies) to avoid electrocution/collisions
- Use the **safest structure design** to avoid electrocution/ collisions
- Try to **prevent the birds from perching** on structures to avoid electrocution
- Modify the structure to **accommodate perching space** to avoid electrocution



Mitigation for collisions

- Mark the line to increase the visibility of the power line, either conductors or earth wire, to allow birds to react in response to seeing the line, and thereby avoid collision



The double coil bird flight diverter (BFD) is widely used at present

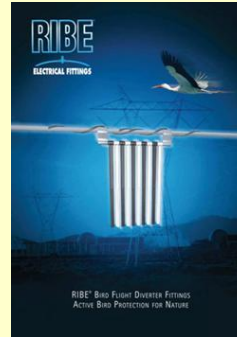


Viper Live Bird Flapper

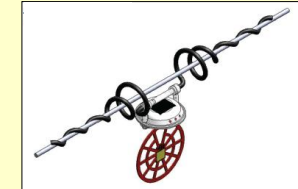


Mitigation for collisions

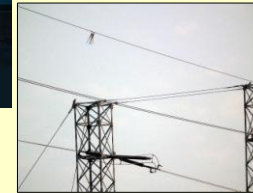
- Some form of illumination is needed for species that fly at night, e.g. flamingos



The Ribe "flag BFD" is large and has moving, phosphorescent (white) parts

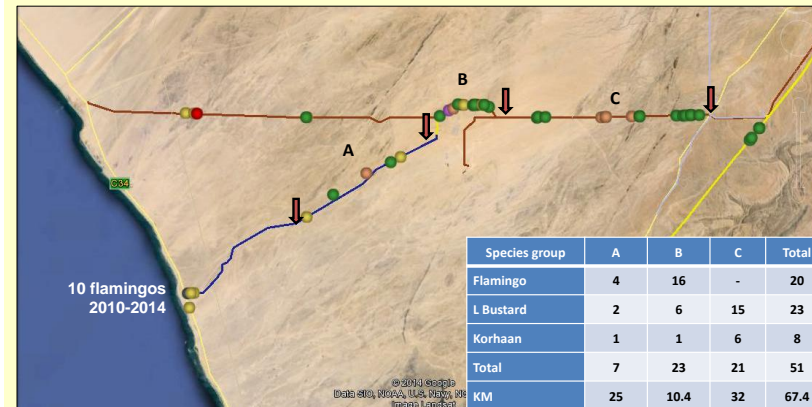


Marker with solar LED light on top is being used experimentally



Mitigation experiments on coast

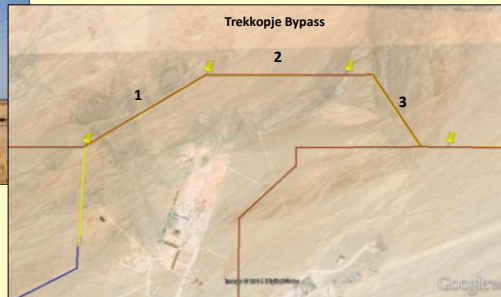
Collision hotspot: Khan-Trekkopje-Wlotzka 51 birds (A-C) - 2009-2014



Collision hotspot: Trekkopje Bypass 51 birds - 2009-2014



Parallel line structures on the Trekkopje Bypass: 220 kV steel pylon (left/south) and 66 kV wooden pole Kamerad (right/north).



Proposed design for marking the Trekkopje Bypass; each section is 3.7 km:

1. Double Loop Bird Flight Diverters and Ribe flag diverters
2. Unmarked as control
3. Double Loop Bird Flight Diverters (only)

Drafting mitigation guidelines for each structure

Collision

- Line capacity (kV)
- Structure type (SWER, HLPCD, Kameraad, steel monopole, etc.)
- Structure diagram/photograph
- Pole heights and span lengths/heights
- Collision risk (L M H – as identified in bird assessment report)
- Marking devices (diurnal, nocturnal), length of line to be marked, spacing and spacing design
- Examples of marked sections and comments

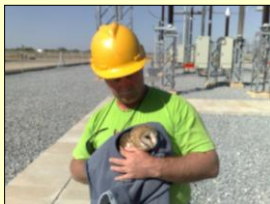
Electrocution

- Structure type (as above)
- Mitigation methods and measures

Acknowledgements

Thank you to:

- NamPower staff, and Regional Electricity Distribution staff (Cenored, Nored and Erongo RED) for their ongoing interest and support
- The NamPower/NNF working group for its invaluable involvement and support
- All the other interested organisations (in particular mines) and individuals for their willing cooperation and contributions, including photographs
- The European Investment Bank for the generous funding, and Nedbank Go Green Fund, Environmental Investment Fund (EIF) Namibia and University of Cape Town for co-funding
- Internet Technologies Namibia for sponsorship of hosting of the EIS for three years



We thank all contributors for the use of their photographs©

Overhead Power Lines

Why, voltage level, structure selection, design, route, construction, foundations and mitigation

Why

- Electrical energy cannot be economical stored in bulk
- Generation must be continuously balanced with consumption
- It is more cost effective to transmit electrical energy, rather than transport fuel to generate close to the load

Voltage level

- Transfer capability of a power line can be expressed as the Surge Impedance Loading of the line.
- $SIL = V^2/Z$
- V Voltage level
- Z Impedance (depends on the electrical properties of the line, line configuration, conductor and bundle conductor)

Design

- Intermediate and suspension structures – they support the mass of the conductor and the wind loading
- Strain – used to terminate and deviate a power line. The loading is much higher, must be able to support the tension in the line plus weight and wind loading
- Strain structure are up to four times more expensive than suspension structures
- Dimension of structure
- Span length
- The final design will be an optimisation of dimension, ie steel tonnage against the span length

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Construction

- Route clearing – 8 to 12m to be cleared of all vegetation.
- Trees to be trimmed to accommodate conductor swing
- Foundations – different foundations for wooden pole, concrete pole, guyed structure and steel lattice self supporting
- Foundation size also depends on the soil classification

Mitigation (Birds)

- The design of the power line has a big influence on mitigation and vice versa
- The routing of the power line is important
- Mitigation must be simple/reliable and cost effective
- Mitigation can be retro fitted
- Mitigation can be difficult/costly to replace on high voltage power lines if they fail

Conclusion

- This presentation is only a summary
- Is there a need for a detailed document?
- Should this document form part of the new proposed mitigation guidelines for power lines?

Consider:

- Include standard project description
- Route selection to avoid impacts is important
- Must not just be technical but also include sensitivities, mitigation options, a framework for the EIA process, etc
- High risk areas for birds cannot go through as areas o.k. for mitigation – careful consideration, perhaps avoidance needed
- We need more studies to confirm the effectiveness of bird diverters, there is virtually no info for bustards
- Agreed that further discussions are needed around linear developments, including pipelines, etc. A workshop on this issue is suggested

My sincere apologies for not being able to attend this mini conference due to other commitments.

Most conservation officers were trained to protect parks with the emphasise on game and general natural resources.

However with the sudden development of mines in parks, it has become a new challenge for all park staff.

The word EIA for the older generation conservationist and park managers was a foreign topic, but as the prospectors and miners started with their activities most of us had to learn very fast on how to read, understand and manage an EIA or EMP

Most of the park managers are more involved in the actual inspections and compliance of the EIA and EMP and depending on the sensitivity of the area, it has become an trail and error situation whereby damage to an area is done irreversibly before the actual solution to an impact is found.

For example it was found that a red metal lawn sprayer is the closest simulator to rain and works very effectively on damaged and disturbed gypsum terrain. But this was only discovered after many mistakes were made, and yes there are experts with better solutions and ideas out there.

I am not saying that all prospectors and mining companies are not rehabilitating and that they do not comply with the EMP and EAI, but the slightest non compliance can become a environmental disaster in the long run.

With the creation of the Environmental Commission, park managers got new hope of assistance from the Commission, and Environmental inspectors will be appointed soon to assist park managers in an ever growing mining industry.

But I believe that inspections and policing of EIA`s and EMP`s is not the only way to go. Education, information exchange and general knowledge of an particular area will ensure that better EIA`s and EMPs are done in future, I also believe that EAPAN can play an important role in ensuring that better EIA`s are written in future, and that cut and paste will become something of the past. It will also help tremendously if the Environmental Commission is fully operational with all post filled to assist park managers in this task.

Institutions such as Gobabeb with all their experience can play an bigger role in parks such as the Namib Naukluft Park and the Dorop National Park in training mining companies and Ministry staff on EIA`s and environmental damage and rehabilitation

More students from the University of Namibia and the Polytechnic of Namibia must be trained and involved in EIA`s and EMP`s and more research must be done on the minimisation of impacts and rehabilitation in sensitive areas.

Training of park managers on EIA`s and EMP`s has become an urgent matter and needs to be addressed as soon as possible. One of the challenges that the Ministry has, is that staff gain experience in an specific area or park, but get transferred or resign. New staff members don't always have the experience and knowledge, and this is when environmental damage happens.

It is with this in mind, that cooperation between all stakeholders is of utmost importance to ensure that all parties are in a win win situation to ensure that the mining industry grows and that the environment is also protected for our future generations.

Thank you very much

H. B. Le Roux

C.C.W.

Notes: Parks

Mining in parks:

- No-go areas required where no mining is allowed? Limit EPLs?
- Staff training – an opportunity for EAPAN to arrange
- There is a vague understanding of the rights – e.g. mining rights in parks
- Action??

EIAs associated with urban land use:

- Documents regarding municipal guidelines etc. are difficult to get hold of. We need some kind of public access system
- The independence /objectivity issue was raised. Small EMPs done externally vs. outsourced, or just reviewed from time to time
- Operational phases must be covered in EMPs
- Impacts on greenbelts – cumulative small portions sold off- precedents- the value of public open space
- Extension of townlands – consider the bigger picture

EAPAN MINI CONFERENCE

MINISTRY OF MINES AND ENERGY
AUDITORIUM

WINDHOEK

10 OCTOBER 2014

BY: VINCENT G. LOUW

DEPUTY DIRECTOR: FOREST AND BOTANICAL
RESEARCH

DIRECTORATE OF FORESTRY, MAWF

FOREST ACT, 2001 (ACT 12 OF 2001) AS AMENDED BY THE FOREST AMENDMENT ACT, 2005 (ACT 13 OF 2005 DEFINITIONS

- "classified forest" means a forest reserve, a community forest or a forest management area;
- "communal land" means land which, in terms of any law which governs communal land, is defined or recognised as communal land;
- "community forest" means an area which, under section 15, has been declared to be a community forest;
- "Council" means the Forestry Council established by section 2;
- "Director" means the Director of Forestry appointed under section 7;

DEFINITIONS CONT...

- "fire management area" means an area which, under section 36, has been declared to be a fire management area;
- "forest management area" means an area which is the subject matter of an agreement entered into under section 16
- "forest produce" means any thing which grows or is naturally found in a forest and
- includes-
 - (a) any living organism or product of it; and
 - (b) any inanimate object of mineral, historical, anthropological or cultural value;
- "forest reserve" means a state forest reserve or a regional forest reserve;

DEFINITIONS CONT...

- "management authority" means the person who or body which has been appointed as the management authority in terms of an order made under section 13(5)(b) or an agreement entered into under sections 13(5)(a), 14(4), 15(1) or 16;
- "management plan" means a management plan prepared under section 12 for a classified forest;
- "protected area" means an area which, under section 21(3), has been declared to be a protected area;
- "protected plant" means a plant declared as such under section 22(5);

CLASSIFIED FORESTS (ss 13-20)

- **13 State forest reserves**
- **14 Regional forest reserve**
- **15 Community forests**
- **16 Forest management areas**

PROTECTION OF THE ENVIRONMENT (ss 21-23)

- **21 Protected areas**
- **22 Protection of natural vegetation**
- **23 Control over afforestation and deforestation**
(the only section that require an EIA)

USE OF FORESTS AND FOREST PRODUCE (ss 24-35)

- **24 Control over forests and forest produce**
- **25 Honey producing organisms**
- **26 Allowable harvest**
- **Licences: 27 Licence to harvest**
 - 28 Licence to graze or carry on agricultural activity**
 - 29 Licence to carry on mining activity**
 - 30 Licence to construct roads or buildings**
- **33 Unclassified forests**

CONTROL AND MANAGEMENT OF FIRE (ss 36-42)

- **36 Fire management areas**
 - The following must be in place:
 - Fire management plan
 - A fire management committee
- **39 Fire hazard areas**
- **40 Prohibition on fires**
 - Prescribes where and when a fire can be lit.

EXPECTATIONS FROM EIA PRACTITIONERS

- Must have good knowledge of the Forest Act (including understanding the various applicable sections) and all relevant laws
- All tree species as well as forest ecological aspects
- Familiarise themselves with management plans with that specific areas and boundaries
- Continuous consultations with forest officials and management authorities within that area
- Provide info on forest resources affected by the development: tree spp and quantity
- Report to DoF on their findings
- Should by all means avoid cutting of any indigenous tree
- EIA report must make provision for companies to report back as required by proposed regulations

KEY ISSUES IN FOREST AREAS TO CONSIDER

- Habitat conservation
- All tree spp; with specific emphasis on - protected spp. and other forest resources; form part of ecosystem
- Roles forests play in people's livelihood (forests provide food, poles, firewood, medicine, timber, shade, fodder, etc)
- These resources are saved as far as possible – even to consider alternatives where possible
- Any management plan in place

KEY ISSUES IN FOREST AREAS TO CONSIDER CONT....

- Natural movement paths of game spp eg. elephants
- Scares forest resources of economic/cultural/ in-kind/ecological importance/own-use
- Planting of unwanted/possible invasive plants
- Know the boundaries
- Type of land use

CHALLENGES DoF FACE WITH EIA'S

- Generally people regard forests as a non-issue while forest resources are the most valuable natural resource we have
- The inconvenience the Forest Act provisions can cause if fully implemented eg crop fields
- Well protected/managed forests always associated with good land for other land uses eg tobacco
- Ability of DoF/Gov. to monitor development activities
- Rehabilitation – some spp cannot be replanted
- Aftercare
- Long-term secondary effects

OTHER

- Convert harvested trees into economical products – funds to plough back into communities
- Removal of trees in road reserves

Appendices:

- Forest Act 2001
- Forest Amendment Act
- National Forest Policy Document

Notes: Forestry

- Forestry recommendations to be included in EIAs
- Trees in Municipal areas are not adequately protected – something to take up with local authorities
- Forestry not really consulted for mining applications

Notes: Mining and prospecting in communal areas

- Importance of community consultation in EPL studies – input into prospecting process- good communication – consent. – but consent is contrary to the Mining Act – only TOR or agreement is possible (mutual agreement of how the works are to take place) – training??
- Beware of companies that are not legitimate
- NO GO areas important
- EAPAN has a big role to promote good practice
- Promote good practice??