

### IN THIS ISSUE

**The NamPower/NNF Strategic Partnership: two years down the line ... p1**

**Phase II of the Environmental Information Service (EIS) completed ... p3**

**Focus on bustards and power lines ... p4**

- Bustard and power lines workshop, and action plan for bird collisions with power lines ... p4
- Is Ludwig's Bustard faced with extinction? ... p5
- Example of a bustard collision hotspot near Vredendal, Western Cape, SA ... p6

**Power line surveys ... p6**

- Kokerboom-Aries (400 kV) ... p6
- Harib-Rock (132 kV) ... p7
- Kokerboom-Nabas (66 kV) ... p8
- Tamarisk-Kuiseb (66 kV and 220 kV) ... p9
- Walmund-Van Eck, Ganab area (220 kV) ... p9
- Standard recommendations for power line surveys ... p11

**Power line/wildlife incidents ... p12**

- Two more flamingos collide on 132 kV power line at Trekkopje ... p12
- Secretarybird collision on 400 kV Aus-Kokerboom line ... p12
- Three vulture collision incidents on 33 kV line ... p12
- White-breasted Cormorant collides with 11 kV power line near Tsumeb ... p13
- Three outage incidents caused by electrocution of spotted genets ... p13

**NamPower uses "Dummy poles" with success to mitigate the Sociable Weaver nesting problem ... p14**

### THE NAMPOWER/NNF STRATEGIC PARTNERSHIP: TWO YEARS DOWN THE LINE

As a result of a growing concern about power line/wildlife conflicts in Namibia, NamPower and the Namibia Nature Foundation (NNF) joined forces in October 2008 in a strategic partnership.

Based on a comprehensive information gathering and research programme, the mission of the partnership is, ultimately, to develop a comprehensive biodiversity information resource – initially focussing on birds – that will assist NamPower, regional electricity distributors (REDs) and all other environmental and industry role players in Namibia to manage power line impacts on the natural environment and *vice versa*.



Concerned participants at the Bustard and Power Lines Workshop at Keetmanshoop in October 2010 examine the remains of a Black-chested Snake-eagle that had collided with the Kokerboom-Aries 400 kV line (photo Ann Scott).

Considerable progress has been made with achieving the project objectives, which are directly related to a dynamic action plan. These three objectives are discussed below.

### Promote awareness/communication about the risks that power lines pose to birds, and birds to power lines

A project website has been set up, on which an information sheet/flyer, newsletters, media releases, workshop reports and other information are available, with relevant linkages. Project newsletters are compiled and distributed, and inputs from readers, including NamPower and RED staff, are being received regularly. Awareness and communication are also being promoted by means of a country-wide series of awareness/training workshops (see below). Media releases are distributed, and ongoing two-way communication is maintained by email and other means. An information booklet and a set of three posters are under production.

### Report, monitor and manage power line/bird interactions

An incident-reporting database has been designed and implemented in order to record bird/wildlife interactions with power lines (e.g. mortalities, roosts, nests, outages etc.) throughout Namibia, both historic and present. Species involved in recently reported mortality incidents include Martial Eagle, Black-chested Snake Eagle, Lesser Flamingo, Greater Flamingo, Lappet-faced Vulture, White-



Black-chested Snake-eagle perched on the Stampriet/Aranos 66 kV line at farm Clave (photo A.C. van Zyl, NamPower).

backed Vulture, Spotted Eagle Owl, Secretarybird, Brown Snake-eagle, White-breasted Cormorant as well as giraffe and small-spotted genet. There is a growing concern about the increasing number of collision incidents involving both Ludwig's Bustard (recently uplisted to *Endangered*) and Kori Bustard, especially in the South. A special workshop was organized at Keetmanshoop in October 2010 in order to address this problem and draft an action plan (see p3 below). Repeated incidents of flamingo collisions on power lines crossing migration routes are also of concern, and funding is being sought for tracking the two flamingo species in order to determine their flight paths more accurately. At the same time, outages caused by nesting Sociable Weavers and Red-billed Buffalo-Weavers are a persistent and ongoing problem that results in much unnecessary expenditure by power suppliers.

A country-wide series of workshops has been launched that focuses on promoting awareness, building capacity and gathering information on wildlife/power line incidents in Namibia. In 2009 workshops were held at Brakwater, Tsumeb, Otjiwarongo, Windhoek, Walvis Bay, Mariental and Keetmanshoop; and in 2010 workshops were held at Gobabis, Omaruru, Rundu and Katima Mulilo.

Dedicated surveys and investigations were initiated along sections of power lines in the Walvis Bay/Swakopmund, Otjiwarongo, Windhoek, Mariental and Keetmanshoop areas in 2009; in the Grootfontein and Swakopmund/Walvis Bay areas in 2010, specifically to investigate reported incidents of flamingo collisions; and in the Ganab area to investigate potential Lappet-faced Vulture mortalities.

Two students at Polytechnic level have been funded to complete regular surveys of power lines (220 kV and 66 kV) in the Windhoek area in 2010. A post-graduate project to investigate Red-billed Buffalo-Weaver (and Sociable Weaver) nesting problems on power lines is being initiated.

## Incorporate bird/wildlife mitigation into the planning of future power line networks

Guideline documents on high risk factors for birds and a bird risk factor matrix have been compiled, for use by NamPower, REDs and other planners of new power line routes. An environmental checklist has also been compiled in consultation with relevant stakeholders, who will use both these documents for support information.

### *The Environmental Information Service (EIS)*

The EIS has been developed under the NNF-NamPower Strategic Partnership and is rapidly becoming a 'one-stop-shop' for public environmental information in Namibia.

Phase 1 concentrated on the overall design of the service, the construction of a search and retrieval system for data, and the compilation of a large variety of databases and published resources, incorporating 2,560 data sets at that stage. The EIS was made public at a large workshop on 14/8/09 at Windhoek, involving a wide spectrum of interested parties, and the website ([www.nnf.org.na/EIS](http://www.nnf.org.na/EIS)) was made available to the public for use and comment.

Recent additions to the EIS (under Phase 2) include the development of an interactive online tool to assess potential interactions between powerlines and birds: allowing users to interrogate available information for purposes of identifying 'hot spots' of environmental sensitivity. This tool should be invaluable to NamPower staff, EIA practitioners and other people involved in environmental issues on the ground.

Two sub-projects of the EIS have enabled the continuation of long-term data sets vital for the project: the entry of a backlog of raptor road count data, supplying important information on raptor distribution, including the utilization of power line structures by raptors; and the downloading of Argos GPS tracking data for a Cape Vulture (*Critically Endangered* in Namibia).

Further details on the EIS are supplied on p3 below.

## Proposed actions for 2011

As the project gathers momentum, the above actions will continue to be expanded.

### General

- Organize a special assessment/planning workshop with key NamPower and RED representatives.

### Awareness/communication

- Continue to build the capacity of NamPower/RED staff and promote public involvement through additional training/awareness workshops (see below) and the production and distribution of training materials
- Promote awareness and communication, primarily by means of the project newsletter and website
- Finalize the production of the information booklet and set of posters

## Report, monitor and manage power line/bird interactions

- **Plan and initiate further mitigation measures, where appropriate, in cooperation with power line suppliers, and monitor their effectiveness; work closely with the EWT Wildlife & Energy Programme (WEP), SA Bustard Working Group, flamingo specialists and related initiatives**
- Continue to monitor and investigate wildlife/power line incidents, encouraging ongoing inputs from power line personnel
- Conduct further dedicated surveys of power lines where problems are experienced or anticipated
- Arrange for further training workshops as required; incorporate this type of training into the activities of NamPower's SHEW personnel
- Initiate a project to determine the flight paths of flamingos in Namibia
- Initiate a post-graduate project to investigate and address the impacts of Red-billed Buffalo-weaver (and Sociable Weaver) nesting on power lines
- Investigate a project on bustards and power lines in Namibia, to supplement the closely related project in South Africa
- Initiate a system whereby exceptional contributions to the project are acknowledged by means of a certificate of merit

## Incorporate bird/wildlife mitigation into the planning of future power line networks

- Build upon the achievements of the EIS by means of a third phase, with further targetted components
- Continue to feed the findings/resources of the Partnership to power suppliers and EIA practitioners

## Acknowledgements

We wish to thank NamPower staff, and Cenored, Nored and Erongo RED staff for their ongoing interest and support for the project; all the other interested organizations and individuals for their willing cooperation and contributions; and the NamPower/NNF working group for its invaluable commitment. The European Investment Bank is thanked for generous funding for the project.

**\*Note that all project workshop reports and newsletters are available on our website ([www.nnf.org.na/nampowerproject.htm](http://www.nnf.org.na/nampowerproject.htm)).**



Ludwig's Bustard in flight (artwork Hermann Cloete).

## PHASE II OF THE EIS (ENVIRONMENTAL INFORMATION SERVICE) COMPLETED

Alice Jarvis & Tony Robertson (email [tr\\_aj@mweb.com.na](mailto:tr_aj@mweb.com.na))



The EIS is currently hosted on the NNF web site and is rapidly becoming the 'one-stop-shop' for public environmental information in Namibia. Access to the information is free, the system is simple to use, and its focus is on providing the greatest volume and variety of information available.

It has been developed under the NNF-NamPower strategic partnership which was launched in October 2008. The partnership's mission is to provide a multi-disciplinary mechanism to assist NamPower to manage its impacts on the natural environment and vice versa, and to develop a biodiversity information resource that will assist Namibian environmental and industry role players to manage impacts on Namibia's biodiversity. The development of the EIS is one component of this partnership.

Recent additions to the EIS under Phase 2 of the project include the development of an interactive online tool to assess potential interactions between powerlines and birds: allowing users to interrogate available information for purposes of identifying 'hot spots' of environmental sensitivity. This tool should be invaluable to NamPower staff, EIA practitioners and other people involved in environmental issues on the ground.

A number of major datasets have been added recently. These include SABAP data and Tree Atlas data for all species, EIA materials and links, literature and data associated with the Okavango, plus a host of recent miscellaneous papers, reports and data sets. To enhance its function as a portal, numerous links to relevant websites have also been added. The EIS now contains information on almost 5000 datasets, of which a substantial proportion is downloadable. In addition, many

of them can be viewed online using the Google Earth plug in on the site. Downloadable files total over 4 GB. Behind the scenes, an Administrator Interface has been developed which allows a logged-in user to do most of the things that are required in order to keep the EIS updated. A user manual has been compiled for the administrator options.

The web interface has also been enhanced and recent developments include:

- streamlining the site design to allow three types of searches to be run from the home page
- adding 'One-click' search option which allows users to search from the home page on data type and theme
- adding Quick links from the search results page for frequently requested datasets such as data from the Atlas of Namibia or other books
- improving the visual impact of the site, through use of icons etc.
- making the site more user-friendly and interactive through addition of 'upload' option and 'forum' so users can contribute information
- enhancing the free text search option to allow more complex searches such as 'exact match', 'all these words' and 'or' options
- allowing users to sort their search results by date
- identifying in search results whether the link is to an internal/external site/link/source
- adding links to key institutions, ministries and additional sources of data and information in Namibia and in the southern African region so that they are returned when appropriate keywords are searched on
- and more...

There is still scope for further improvement – please try it out and send feedback using the contact form on the site. Use the Upload button or the contact form to submit more information, documents, reports, links to websites etc.

Get involved and help to further improve the EIS!  
<http://www.nnf.org.na/eis>



## FOCUS ON BUSTARDS AND POWER LINES

### Bustard and Power Lines Workshop, and action plan for bird and power line collisions



The Bustard and Power Lines Workshop included a survey of the 400 kV Kokerboom-Aries line near Keetmanshoop on 12 October 2010, when the carcasses of six bustards (including this female Kori Bustard) and two raptors were found over a distance of 11.5 km (*photo Ann Scott*).

Due to the above-mentioned concern about the impacts of power lines on bustards in Namibia, and the impacts of such collisions on the power supply, the NamPower/NNF Strategic Partnership initiated a workshop at Keetmanshoop on 12-13 October 2010.

The participants were: Pieter Cloete, AC van Zyl, Thomas Muronga, Brian Beukes, Craig Cupido, Gawie Rossouw, Gloudi de Beer, Reginadia Hofnie (NamPower); Dr Chris Brown: facilitator (Namibia Institute for Sustainable Development [NISD]); Jessica Shaw (Percy FitzPatrick Institute, UCT) and Mike & Ann Scott (NamPower/NNF Partnership).

The primary aim of the workshop was to address the impacts of bustard and power line collisions, especially in the south of Namibia, and to investigate possible mitigation measures.

The objectives were to:

- Provide information on the NamPower/Namibia Nature Foundation Strategic Partnership
- Introduce the Environmental Information Service (EIS)
- Obtain a better understanding of the nature and extent of bustard and power line interactions and their respective impacts
- Explore potential mitigation measures
- Discuss practical monitoring and information management
- Develop a focussed action plan for collisions of bustards (and other birds) with power lines

## Workshop presentations

\*Note that all of the power point presentations below are available on our website:

- The NamPower/Namibia Nature Foundation Strategic Partnership (Mike Scott)
- The Environmental Information Service [EIS] (presented by Chris Brown & Mike Scott)
- Findings to date on bird/power line collisions in Namibia (Ann Scott & NamPower staff)
- Bustard conservation in southern Africa, with a focus on Ludwig's Bustard and Kori Bustard (Jessica Shaw, Percy FitzPatrick Institute)
- Researching the impacts of power line collision mortality in Ludwig's Bustards (Jessica Shaw, Percy FitzPatrick Institute)
- Practical session: identification of bird species commonly involved in power line incidents (Ann Scott & Chris Brown)
- Field trip to the 400 kV Kokerboom-Aries line

## Action plan for bird and power line collisions

### 1. Set up and initiate a sampling methodology for transmission and distribution lines

- Geographic coverage and methods
- Frequency

### 2. Set up & implement population monitoring methodologies & practice

- Collision mortality: power line coverage – transmission and distribution (including REDs and SWER lines); set up sample lines, taking access into account
- Selected species monitored: Kori Bustard and Ludwig's Bustard, Secretarybird, eagles and vultures; korhaans, storks, flamingos and any other medium to large birds
- Compatibility between bustard projects in SA and Namibia: details of sampling protocol
  - mortality
  - relative abundance
  - real population estimate?
  - distribution (bird atlas data)
- \*Information on breeding and young
- Also power line surveys
- Comparative monitoring – lines with and without mitigation (e.g. Kokerboom-Namib: new line has flappers, old line has none)

### 3. Compile guidelines for best practice mitigation for collisions on power lines

- Investigate all methods to make earth and optic overhead lines more visible e.g. flappers, illuminators, pigtailed, vibration dampers, reflective devices, sound generators, colour coating on lines
- Look at mitigation for:
  - Existing lines: refit where necessary (reactive) – dependent on results of monitoring
  - New lines - pre-emptive (proactive)
- Best available information in guidelines
- Standards for lines – mines/farmers, lodges etc.: ECB & MME (& MET)

### 4. Recruit a Namibian MSc student

- Linked to NamPower bursary scheme – meet with Management

### 5. Information, awareness, education & outreach (Booklets, posters, other visuals; Afrikaans); EIA practitioners for best practice guides & mines/developments)

- Determine extent of problem
- Ways of mitigation and preventing
- Good practice and awareness
- Reporting: also to farmers' meetings, schools, communities as a whole
- PRO in each area
- \*Review draft 'Birds and power lines' booklet in light of this meeting

### 6. Identify and address other interactions between power lines and wildlife

### 7. Experiment with new/different mitigation options for existing (and new) lines

### 8. Collaborate with further partners

Liaise with ECB, MME, MET

### 9. Investigate potential impacts of wind farms

Desk-top review to draw up best-practice mitigation (five years down the line)

- Determine possible impacts (collisions)
- Start preparing: mitigation & good practice guides

### Acknowledgements

Thank you to:

- All our enthusiastic participants!
- NamPower staff for their assistance with organization and logistics, and for their interest and willingness to facilitate the power line inspection; in particular Danie Louw, André Reyneke, Hans Peens and Pieter Cloete.
- Dr Chris Brown for facilitating the workshop and coordinating the action plan.
- Jessica Shaw, whose participation was supported by the Percy FitzPatrick Institute, Mazda Wildlife Fund and the Eskom/EWT Partnership.
- The Canyon Hotel & Casino for the venue and refreshments.
- Training materials/inputs: Chris van Rooyen, Alice Jarvis (EIS) and Liz Komen (NARREC).
- The European Investment Bank for sponsoring the project.

## Is Ludwig's Bustard faced with extinction?

**BirdLife South Africa:**

[www.birdlife.org.za/page/5561/bustard\\_working\\_group](http://www.birdlife.org.za/page/5561/bustard_working_group)

Three of South Africa's flagship bird species have moved closer to extinction, according to BirdLife on behalf of the 2010 IUCN Red List. The African Penguin's status has changed from *Vulnerable* in the 2009 category to *Endangered*, the Ludwig's Bustard from *Least Concern* to *Endangered* and the Southern Ground Hornbill from *Least Concern* to *Vulnerable*.

According to Dr Hanneline Smit, BirdLife South Africa's Conservation Division Manager, "the decrease in numbers and range of these three birds is great cause for concern". Mark Anderson, BirdLife South Africa's Executive Director, confirms that "the populations of all three these species which almost exclusively occur in southern Africa are rapidly declining due to a variety of human impacts".

The bulk of the Ludwig's Bustard population is found in southern Africa. "The major threat to this species' survival is collisions with power lines", explained Anderson. Work done by Anderson during the early-2000s showed that every kilometre of transmission power line in the eastern Karoo kills one bustard per year. "The population cannot maintain these mortalities", he added. For the Ludwig's Bustard, global population estimates are outdated (around 20 years old) and in urgent need of revision.

Conservation measures proposed by BirdLife South Africa's Bustard Working Group include obtaining an updated population estimate, measure bustard collision rates with power lines across the whole range of Karoo habitats, improve knowledge of how the species visually perceives power lines and monitor annual movements.

### Examples of a bustard collision hotspot near Vredendal, Western Cape, SA

Jessica Shaw (email [jessica.shaw@uct.ac.za](mailto:jessica.shaw@uct.ac.za))

On my October 2010 survey of transmission power lines in the Karoo, I recovered a huge number of Ludwig's Bustard mortalities on one section of the 400kV Helios-Juno line. In three months, at least 34 bustards died in just 20 spans, which highlights their extreme vulnerability to collision. The section is on top of a ridge, and has a few broken old-style flappers on one earth wire, so has clearly been a problem in the past. While the bustard numbers in the area have been high in the last few months, it is still an exceptionally high collision toll, and is a minimum estimate – most remains had been completely scavenged so it is probable that we didn't count all birds that died.



The collision hotspot from Jessica's last survey: unfortunately there were mostly only feathers left but three feather "sprays" can be seen (photo Jessica Shaw).

## POWER LINE SURVEYS

### Power line survey Kokerboom-Aries 400 kV (12 October 2010)



Google image of the area investigated, showing sites of eight incidents (see below) that are clustered mainly in an area where the 400 kV power line (red) runs parallel to a watercourse; other colours represent different power lines/roads (based on a Google map generated by Alice Jarvis [EIS]).

#### Survey details

A section of the 400 kV Kokerboom-Aries line north-east of Keetmanshoop was inspected on 12/10/10 (14h15-16h30). The team consisted of Pieter Cloete (leader), AC van Zyl, Thomas Muronga, Brian Beukes, Craig Cupido, Gawie Rossouw, Gloudi de Beer, Reginadia Hofnie (NamPower); Chris Brown, Jessica Shaw and Mike and Ann Scott. The distance covered was from poles 621 – 598 (11.5 km - towers are 500m apart) (26.44800S 18.33434E to 26.49621S 18.41732E).

#### Motivation

The area has a high potential for wildlife/power line interactions due to the convergence of several power lines, dry watercourses and strong winds experienced. Problems have been recorded previously in the same area on 10/11/09 (three carcasses) and 19/11/09 (five carcasses). The habitat is open with gravel; sparse grass and some bush. More bushy in the (dry) watercourse running NW to SE; windmill and stock water point nearby.



Structure of the 400 kV Kokerboom-Aries line; near-invisible earth wire and optic cable are indicated by arrows (photo Ann Scott).

**Findings**

**Bird mortalities (8)**

Black-chested Snake-eagle (juvenile; 26.45005S

18.33726E, tower 621-620, midspan, carcass fairly fresh)

Kori Bustard (adult female; 26.47896S 18.38735E, tower 608-607, midspan, carcass <1 month); and bustard (leg only, tarsus 11.6 cm, fairly fresh)

Kori Bustard (adult female; 26.47989S 18.38918E, closer to tower; tarsus 17.4 cm, fairly fresh)

Bustard (feathers only)

Bustard (26 29.783S 18 25.065E, tower 607-606; wing only, fairly fresh)

Bustard (tower 605-604, 26.48506S 18.39800E, close to tower; many feathers only)

Raptor (feathers only)

**Bird nests**

A few Sociable Weaver nests on the lower parts of the towers; one crow's nest (tower 609-608)

**Live birds observed in area**

Two live Kori Bustards (tower 608-698; 15h25); no raptors

**General comments**

- The collision issue appears to be greater than anticipated; species involved are bustards, eagles, Secretarybirds; but collisions also affect a wider range of species.
- There is a definite overlap between the initial two surveys in November 2009; some overlap is also possible between the surveys of 19/11/09 and 12/10/10.
- More frequent surveys (e.g. every three months) should now be carried out on the identified 'hotspots'.
- Hotspots appear to be linked to drainage lines and water points.

**Comparison of results of two comparable surveys of the 400 kV Kokerboom-Aries line**

19/11/09		12/10/10	
Tower(s)	Mortalities	Tower(s)	Mortalities
608 - 607	Kori Bustard (close to tower)	621 - 620	Black-chested Snake-Eagle
		608 - 607	Kori Bustard (adult female, midspan) Ludwig's? Bustard (leg, juvenile) Kori Bustard (adult female) Bustard? (feathers)
607 - 606	Ludwig's Bustard (close to tower)	607 - 606	Ludwig's? Bustard (juvenile, wing)
		605 - 604	Bustard (lots of feathers) Raptor (feathers)
600 - 599	Kori? Bustard (midspan) Kori? Bustard (midspan) Secretarybird		
<b>Total mortalities</b>	<b>5*</b> <b>(0.4 per km)</b>		<b>8</b> <b>(0.7 per km)</b>

\*Note that only three mortalities were found on this same section of line a week before the first survey, on 10/11/09



Mortalities on the Kokerboom-Aries 400 kV line survey included a Kori Bustard (adult female; above) and an unidentified bustard (below; photos Ann Scott).

**Power line survey Harib-Rock 132 kv (14 October 2010; Keetmanshoop/Karasburg)**

**Survey details**

Part of the Harib-Rock 132 kv (Keetmanshoop/Karasburg) was surveyed on 14/10/10 (08h15-13h15) by Pieter Cloete (leader) and Mike and Ann Scott. The distance covered was from Poles 237 – 243 (start 28.389622S 19.146786E). The habitat is open with gravel, sparse grass and some bush. Well-defined water courses run more or less parallel to the line. There is a stock water point near the line at Pole 237.

**Motivation**

The line has a high potential for wildlife/power line interactions due to its structure, with a relatively invisible earth wire above the three more visible conductors. Five of the poles collapsed in January 2010 and three carcasses were found by NamPower personnel who visited the site on 14/1/10: two Lappet-faced Vultures and one other large bird (bustard).

**Findings**

**Bird mortalities (2)**

Kori Bustard (28.3885S 19.16736E, poles 234 - 235, midspan, 4m from centre of line on northern side (prevailing wind from south?))

Bustard (juvenile; carcass remains older than previous one; 28.38794S 19.17681E; poles 237-238; near pole, 15m north of line)



**Power line survey Kokerboom-Nabas 66 kv  
(28 October 2010; Keetmanshoop/Koës)**

Report by Pieter Cloete (Pieter.Cloete@nampower.com.na)

**Survey details**

On 28 October 2010 Pieter Cloete & K. Ndjakaviti (1) and S. Kapiye & T. Ndokaneka (2) surveyed the Kokerboom – Nabas 66 KV line (07h30-16h30) for 100 km. Kokerboom S/S S:26 25,288 EO 18 17,428 to Nabas S/S South: S26 07,916 E O 19 13,562.

**Motivation**

This was a monthly line inspection, including to remove Sociable Weaver nests where necessary.

**Findings**

***Bird mortalities (2)***

***Kori Bustard*** (3 km east of Nabas 66 kV section links; S26 17.977 E18 37.951; mortality due to collision; carcass one month old, head removed by scavengers – only feathers left in a radius of 5m).

***Kori Bustard*** (S26 16.694 E18 46.240, mid-line, two weeks old, not scavenged; carcass intact, head and legs clearly visible).

**Recommendations** – see p11.



Top: Google image of the area investigated, showing sites of two incidents (green markers). The 132 kV power line is indicated in pink; C10 road in white; note well-defined water courses running more or less parallel to the line

(based on a Google map generated by Alice Jarvis [EIS]).

Centre: Structure of the 132 kV Harib-Rock line; near-invisible earth wire is indicated by arrow (photo Ann Scott).

Bottom: Pieter Cloete and Ann Scott investigate a fresh Kori Bustard carcass beneath the 132 kV Harib-Rock line (photo Mike Scott).



Large, unidentified pellets found beneath tower

**Bird nests**

A few Sociable Weaver nests, on camel thorn trees in water courses; crow's nests

**Live birds observed in area**

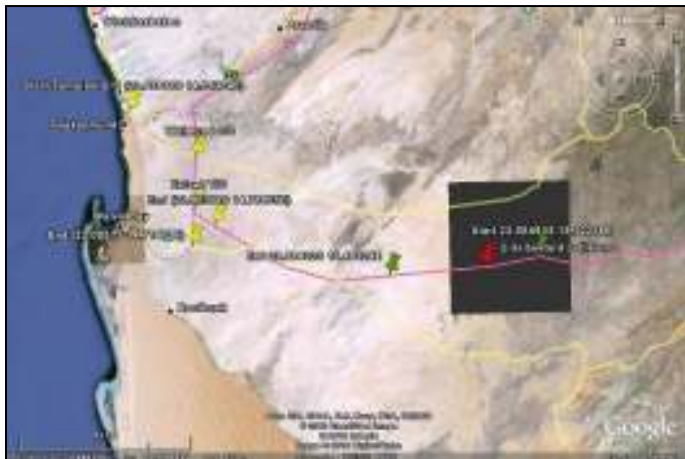
2x Secretarybirds, Greater Kestrel, Sandgrouse, Sociable Weavers (nests); signs of crows perching on power lines

**Recommendations** – see p11.

Top: Kokerboom –Nabas 66 KV line; Centre and below: Remains of Kori Bustard (centre; often the heads are scavenged, making identification difficult) and unidentified bustard (photos Pieter Cloete).



## Power line survey Tamarisk – Kuiseb – Van Eck 66/220 kV lines (coast: 19 November 2010 and Ganab: 16 December 2010)



Google image of power lines in the central coastal area, showing the areas investigated (yellow markers: survey 1 and green markers: survey 2; 220 kV line = pink); roads are yellow (based on a Google map generated by Alice Jarvis [EIS]).

### Tamarisk – Kuiseb and associated structures (see yellow markers on map above)



Structure of the 66 kV line with wooden poles and three large conductor wires, east of Walmund S/S. In this typical coastal desert habitat, dry water courses (red arrow) may be used as flight paths by nocturnally flying species such as flamingos, where power lines would be a potential collision threat (photo Ann Scott).

#### Survey details

On 19/11/10 (09h15-13h15), Mike and Ann Scott (NP/NNF Partnership) inspected (1) the 66 kV line from Tamarisk D/S north of Swakopmund to Walmund S/S and south to Kuiseb S/S and the C14 (51.9 km); and (2) the 220 kV line from Walmund S/S south to Kuiseb S/S and east for 7.8 km (44.8 km). The desert habitat consists of open gravel plains with dry water courses, and very little vegetation.

#### Motivation

The western part of the coastal power lines potentially falls within the speculated flight path of flamingos between the coast and Etosha National Park. Recently

several flamingo collision incidents have been reported on power lines, including on the coast (November 2009: two incidents involving one and three birds; November 2010: two birds) and near Grootfontein (November 2009; 20 birds).

Wicus Meyer (NamPower) has commented, "In April 2010 we have carried out 2x helicopter inspections specifically to look for flashovers on insulators caused by lightning, birds or bird nests as we have experienced many 'trips' due to possible heavy lightning storms at the time. We haven't noticed any large bird carcasses underneath the 220kV line at that stage".

However, it was decided that in view of the unprecedented increase in mining activities and associated new power lines, a ground inspection of representative parts of this line should be carried out as an aid to the various EIA processes for the power lines.

#### Findings

No bird mortalities were found, and no bird nests.

Dry water courses on the coast i.e. roughly from north-east to south-west, which coincides with the general direction of speculated flamingo flight paths, e.g. from the Walvis Bay Ramsar Site to Etosha, possibly along the Swakop/Khan rivers. Power lines situated in these habitats may thus present a potential threat, especially to birds flying at night and especially new lines.

Parts of the habitat beneath the 66 kV line (east of Walmund) have been disturbed with the construction of the pipeline and are very soft, a source of dust in strong wind – an added potential threat to visibility.

There was a variety of lichens at the junction of the 66 kV line (right) and the 220 kV line near Walmund S/S.

**Recommendations** – see p11.

### Walmund – Van Eck 220 kV: Ganab area (see green markers on map above and on p10)

#### Survey details

On 16/12/10 (10h00-12h15), Mike and Ann Scott (NP/NNF Partnership) inspected the 220 kV line in the Ganab area (north of the D1982 road), from the border of Namib Naukluft Park for 44.8 km westwards. The desert habitat comprises open gravel plains, with very little vegetation apart from a few camel-thorn trees along dry water-courses.

#### Motivation

The largest concentration of breeding Lappet-faced Vultures at present is found mainly south of the 220 kV line at Ganab. This area includes the Hotsas water hole, which is used regularly by the birds. The section of line in the Ganab area could thus be a potential collision site for Lappet-faced Vultures.

Peter Bridgefjord of *Vultures Namibia* has mentioned, "I have no reports of vulture/raptor mortalities from these lines. Have flown along parts of it and also the one next to the C14. Also driven short parts of the latter. No birds found."



Top: Google image of the Ganab area investigated (green markers; 220 kV line = pink ); roads are yellow (based on a Google map generated by Alice Jarvis [EIS].

Centre: Remains of one of three bustards that had collided with the 220 kV power line.

Below: Possible flight path (red arrow) of bustards colliding with power line (photos Ann Scott).

Other large birds recorded in the area include the Kori Bustard, Ludwig's Bustard and Rüppell's Korhaan. In view of the unprecedented increase in mining activities and associated new power lines (see above), an inspection of this line was also carried out as an aid to the EIA processes for the power lines.

## Findings

### **Bird mortalities (3)**

**Bustard x3** (23.07856E 15.56656E, Tower 606-607; feathers only, fresh: 1x Ludwig's Bustard; 1x Kori Bustard; 1 unidentified bustard)

As the carcass remains were close together, it appears that the birds may have been following a flight path west of the rocky outcrop running north-south (see left).



Red and white flappers have been fitted to most of the line surveyed; however, the majority have snapped off on the plastic part (see above); the fittings were still secure and evenly spaced). The terrain is open with good visibility of the line; however, the thinner earth/optic wire above the main conductors is a collision threat to both bustards and vultures.

\*No sign of vulture mortalities found

### **Birds' nests**

Tower 612: part of a crow's nest

Tower 664: small nest (crow/Greater Kestrel?)

### **Wildlife observed in area**

Lappet-faced Vultures: 6 on trees, 2 flying (over line)

Greater Kestrel: 1 perched on pylon

Warthog: 3

Mountain zebra: small herd

Black Crow: 3

Pied Crow: perched on pylon

Rüppell's Korhaan: 2

Lanner Falcon: 1

Warthog: 1

Meerkat: 5

Ground squirrel: 1

### **Recommendations**

Mitigation of this section of line with a suitable marking method is considered urgent (existing broken flappers should be replaced); see also p11.

### **Acknowledgements**

Wicus Meyer, Danie Louw and Bernhardt Doeseb (NamPower) for kindly facilitating the surveys; Peter Bridgeford (*Vultures Namibia*) for comments on previous incidents.

## Standard recommendations for power line survey reports

*\*Note that details may vary, depending on the power line and the local situation*

Patterns of collisions involving an increasing number of bird/wildlife mortalities are of critical concern. As scavengers may have removed whole carcasses, the recorded figures are considered to represent minimum numbers of collisions. Bearing in mind that lines may have been in existence for a number of years, the historical extent of the collisions/ mortalities is usually unknown; however, if one were to multiply these minimum figures by the length of the line (and other similar lines) and per month/year, the result would be a significant off-take from relevant bird populations.

The initial findings would therefore justify a much expanded monitoring survey in order to obtain some idea of the greater impact through large sample sizes, as well as any geographic trends. Ludwig's Bustard has recently been uplisted to Endangered, one of the chief threats being power line collisions. A number of other bird species susceptible to power line collisions are also on the Red Data list, including Lappet-faced Vulture, White-backed Vulture, Martial Eagle, Tawny Eagle, Lesser Flamingo and Greater Flamingo.

The recommendations below should therefore be considered as extremely urgent.

### 1. Assessment of the extent and areas of impact

Continue with surveys and regular monitoring of the whole of the area covered by the relevant line(s), using a standardized form; based on the findings, make an assessment of the areas where mitigation is a priority. Given the constraints on NamPower resources during the rainy season, investigate supplementary counts by trained volunteers *Flamingos migrate after the first rains inland, from late October to early December, and then back again at the end of the rainy season. There is an urgent need for expanded monitoring surveys along all potential flamingo flight paths (e.g. water courses on the coast) in order to obtain some idea of the greater impact of power line collisions through large sample sizes, as well as any geographic trends.*

### 2. Mitigation

Investigate mitigation in problem areas, as soon as sufficient information is available. The marking of the two less visible wires (earth wire and optic cable) with Double Loop Bird Flight Diverters (or a modification) may be a possible option, although no truly effective mitigation methods is available for bustards; obtain advice from the experts such as the Endangered Wildlife Trust Wildlife & Energy Programme (WEP) and SA Bustard Working Group as/when new mitigation possibilities become available.

*For flamingos, the "Mace Bird Lite" and/or blinking solar powered aviation lights attached to the optic fibre ground wires could be tested on an experimental basis. Investigate markers that could emit an (ultra-sonic) auditory signal.*

### 3. Monitoring

Include ongoing monitoring during regular NamPower activities, to determine:

- Effectiveness of mitigation measures
- Any further problem areas

### 4. Awareness

Continue to promote awareness about the problem and reporting method to NamPower staff and other stakeholders, especially the farming community and power CCs.



LEFT  
Juvenile Martial Eagle (*Breëkoparend*) just outside Langer Heinrich Mine at Arandis on 9/12/10  
(photo Theo Wassenaar)



RIGHT  
Lappet-faced Vulture (*Swartaasvoël*) near the Stampriet/Aranos 66KV line at farm Kameelboom  
(photo A.C. van Zyl)

## POWER LINE/WILDLIFE INCIDENTS

### Two more flamingos collide on 132 kV power line at Trekkopje

**Sandra Muller** (Environment Manager, AREVA Resources Namibia; email [sandra.muller@areva.com](mailto:sandra.muller@areva.com))



On 11/11/2010 at 17h00 two (Greater) Flamingos were found under the power line, about 100 m east of the generators at the NamPower substation next to the Wlotzkasbaken desalination plant. They appeared to have collided with 132 kV line, more or less midspan. The birds were still (just) alive when found, and taken to Dr Sandra Dantu in Swakopmund to see if they could be rescued. One died during the night, the other with a broken wing had to be put down the next morning.

What can be done to prevent such incidents? Seeing that flamingoes fly at night, is there a possibility of fixing lights to sections of the power line? I don't know if they are available here, but in Europe you get cheap solar-powered lights that store energy during the day and shine most of the night.

#### More news on flamingos

**Gisela Noci** (email [Gisela.Noci@ate-group.com](mailto:Gisela.Noci@ate-group.com))  
Regarding the article on the threat of the Trekkoppje power line to the migrating flamingos, I just thought to tell you that we watched them in their thousands leaving the coast this evening (31/10/10) - so monitoring in the next few weeks would be appropriate.

**Günther Friederich** (email [bateleur@iway.na](mailto:bateleur@iway.na))  
28/1/11: We had a few flamingo fly-bys in the past, quite low one morning, very much higher during nights, scarcely audible (Tsumeb area, S18° 52' 25,2" E18° 06' 02,1").

**AC van Zyl** (email [AC.Van.Zyl@nampower.com.na](mailto:AC.Van.Zyl@nampower.com.na))  
Three more flamingo mortalities on power lines in 2002 were reported at the Kalkpan retic. (south-east of Aranos) on a HLPCD line (landowner Hannes Steyn, Bloukop Farm – Turksvy Pan, going west).

### Secretarybird collision on 400 kV Aus-Kokerboom line

**AC van Zyl** (email [AC.Van.Zyl@nampower.com.na](mailto:AC.Van.Zyl@nampower.com.na))



The 400KV Awas - Kokerboom/No: 6 line was inspected on 9 March 2010. The Secretarybird was found midspan between pole 498 – 496, next to border fence 251. The line route runs from north to south. The area is very flat, like a pan, and the bird was travelling from east to west. The carcass was very fresh (1-2 days). Must be in area between Hardap Dam ( Fish River) to Maltahöhe tar road. A dead cow was also found on the same line at Tower 637 on 6 March 2010; it was at midspan under 400 KV line next to border fence 251, on the western side. (A second incident involving a cow was handled by Mariental District.)

### Three vulture collision incidents on 33 kV power lines

**Pieter Cloete** (email [Pieter.Cloete@nampower.com.na](mailto:Pieter.Cloete@nampower.com.na))



On 18/10/2010 two (Lappet-faced?) vultures collided with the Kiris 33 kV HLPCD retic. near Aroab (S26 27.861 E 19 37.224 – 200 m north of this reading). Only the skeletons of the birds were left. No. 1 collided midspan and No. 2 was on the pole.

\*On 18/12/08, another vulture mortality (White-backed Vulture) was found on this line about 1 km away.

(PTO for more photographs)



*Top:* The first vulture collided midspan on the Kiris 33 kV retic. near Aroab (see p11).

*Centre:* The remains of the second vulture were found nearer to the pole;

*Bottom:* A fresh White-backed Vulture carcass was found on the same line, 1 km away from the above two vultures, on 18/12/2001 (photos Pieter Cloete).

### White-breasted Cormorant collides with 11 kV line near Tsumeb

Günther Friederich (email [bateleur@iway.na](mailto:bateleur@iway.na))

The incident took place on the 11 kV line on 28/1/11 at Tsutsab 293, Tsumeb, Station No. 12435 (S18° 52' 25,2" E18° 06' 02,1"). An immature White-breasted Cormorant collided with the line, close to the drop fuses before the section leading to the transformer. The bird was fishing on a farm zinc reservoir at home during the late morning and flew off into the line. We saw the event happen, and heard a sizzling sound on the line and an explosive sound on the surge protectors. The only injury was on the neck, below the head. The bird was sent to Joris Komen.

Our vlei on the farm is filled since 20/1/11. On 27/1/11 we had another 53mm of rain. When I went outside on the next morning I saw two White-breasted Cormorants landing on the farm zinc reservoir, fishing for tilapia. They are new records for the QDS 1818 CC. Later during the day they were back, I managed two photos before the birds flew off, one colliding with the power line. Yesterday

afternoon, 1/2/11, one bird was back on the reservoir. I saw him on the vlei again late afternoon. We have tilapia in the reservoir. There is no fish available yet in the vlei.



*Top:* Site of collision of a juvenile White-breasted Cormorant on a 11 kV line near Tsumeb;

*Centre:* The cormorant stretches its wings shortly before the collision;

*Bottom:* Neck injuries on the cormorant (photos Günther Friederich).

### Three outage incidents caused by election of spotted genets (*muskejaatkatte*)

#### One genet electrocuted

Pieter Cloete (email [Pieter.Cloete@nampower.com.na](mailto:Pieter.Cloete@nampower.com.na))

On 12/8/2010 at the Karas T-off S/S near Grünau, Karasburg district (S27°47'04,09" E18°29'00,4") a genet climbed onto the 22 kV jumpers and was electrocuted (see photo on right), causing a power outage.



### Two genets cause outage

Pieter Cloete (email Pieter.Cloete@nampower.com.na)

On 20/8/2010 on the Kiris 33 kV Retic. near Aroab, Keetmanshoop at Wildheim (S 28 06.751 EO 019 49.545) two genets climbed onto the 33 kV section links and were electrocuted, causing an outage.

### One genet electrocuted

Brian Beukes (email Brian.Beukes@nampower.com.na)

On 12/10/2010 at the Kokerboom S/S, Keetmanshoop district, one genet climbed onto the 33 kV CTs of transformer 31, was electrocuted and caused an outage (see photos below).



### Dummy poles used to move Sociable Weaver nest

Pieter Cloete (email Pieter.Cloete@nampower.com.na)

Dummy poles were used with success on an overshot 19 kV reticulation line (see photos below).



## NAMPOWER USES DUMMY POLES WITH SUCCESS TO MITIGATE THE SOCIABLE WEAVER NESTING PROBLEM

AC van Zyl (email AC.Van.Zyl@nampower.com.na)

Effective management of Sociable Weaver nests in the Aranos area has **reduced outages from 11 to 2 (or less) per week**. Prior to this NamPower staff had to travel 186 km twice a week to remove these weaver nests. The integrated strategy includes the translocation of nests (see photo below), based on a study of local behaviour

patterns and regular monitoring and removal of any signs of nesting on the original site; applying rubber silicon insulators; and making nesting 'baskets' of old conductors.



A Black Stork (Endangered; *Swartooievaar*) perches on a HLPD line on the C28 road between Mariental and Maltahöhe. The recent rains have attracted many wetland birds to ephemeral waterbodies, where such power line structures may be a potential threat (photo Ann Scott).