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STEADY PROGRESS WITH PROJECTS

The Energy White Paper, Vision 2030 and NDP3 set ambitious objectives for the Namibian energy sector and acknowledge the vital role played by energy in the country's economy and development. The power line network coverage across Namibia is increasing rapidly as a result of the installation of lines for new mining and other developments as well as many new private lines, and the Government's effort to give access to affordable and appropriate energy supplies to households and communities. The construction of power lines is a necessity; but in doing so there are potential adverse effects on the environment. Fortunately, power suppliers are sensitive to these impacts, and much is being done to address them.



NamPower has initiated mitigation trials to address outage problems caused by Sociable Weaver nesting in the South, making use of "dummy poles" (right; *photo Pieter Cloete*)

Our Environmental Information Service (EIS) is moving forward rapidly both in terms of content and functionality, and with the development of various exciting atlas functions. It now contains more than 6 000 data sets!

Generous funding has been obtained from the Environmental Investment Fund (EIF) of Namibia for satellite trackers (GPS PTTs) for flamingos. This will support the existing Go Green Namibia Flamingo and Power Line Project, which is also being expanded to include an initiative to track flamingos from the ground.

NamPower has initiated a project with a bursary to a Namibian Honours student at University of Pretoria, Julia Amukwa, to address the impacts of nesting by Sociable Weavers and Red-billed Buffalo-weavers on the power supply. The regional staff in the South have also initiated "dummy pole" trials for the mitigation of Sociable Weaver nesting. A project on interactions between bustards and power lines has been initiated through the University of Cape Town, and MSc student John Pallet is hard at work. Recent research brings new understanding to the visual and other sensory aspects of bird collisions on power lines – but these findings increase the challenges of finding effective mitigation solutions.

Regular power line surveys are providing a sound scientific basis for determining the effects of power line incidents on bird populations. The extent of bird mortalities on power lines is as yet unknown, but the documentation of such incidents is a first step towards addressing the situation. We would like to thank all those who take the time to submit this information for our database. The dedication and commitment of all those involved is a sound basis for the way forward.

Search

The EIS

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What's new?



What's new since the last newsletter?

The EIS continues to develop and grow, both in terms of content and functionality.

Over 800 citations have been added, addressing:

- bird collisions with power structures
- vegetation, including links to all articles in the archive of Dinteria and Agricola on the NBRI website
- national development, poverty and AIDS
- new climate change reports
- effects and use of fire on savanna
- CBNRM in Namibia
- desert landscapes
- World Heritage Sites
- bush encroachment
- fairy circles
- palaeogeography
- biodiversity planning
- river basin management

In fact, topics from almost all environmental disciplines are included encompassing journal articles, reports, books, posters, websites, theses, spatial datasets and more.

Save results to Word file

Once you have run a search you can now export your search results with one click, using the new **Save results to Word file** button.

A reminder: Under the CONINFO button you can find up-to-date shapefiles and kmz files of all registered and emerging communal conservancies, community forests, concession areas etc. These are typically updated within a few days of new conservancies being gazetted.



Upload

Thanks to those of you who help to keep the EIS updated by contributing information. Please make use of the **Upload** button to send in any new reports, links etc that you would like to see listed on the EIS.

ATLASSING IN NAMIBIA

Regular visitors to the EIS will have noticed the new option "Atlassing in Namibia".



Following many discussions with stakeholders, it was agreed that the EIS will become the home of several new atlassing initiatives in Namibia. These include the SABAP2 (bird) atlassing project, in collaboration with the Animal Demography Unit of the University of Cape Town; atlassing of Namibia's carnivores, in collaboration with LCMAN (The Large Carnivore Management Association of Namibia) and atlassing of mammals in general in collaboration with the new Africa-wide MammalMAP project.

A prototype atlas data recording form is under development, initially designed to cater for carnivore atlassing. Once the carnivore monitoring is up and running it will form the foundation for other biodiversity monitoring schemes. Many potential schemes have been discussed including monitoring and mapping of alien plants; butterflies and dragonflies; reptiles, amphibians and frogs; rainfall; and more.

In order to test the new atlassing components - and to contribute atlas data - you need to register with the EIS. Registering is easy and only takes a couple of minutes and we already have more than 50 registered EIS members.

INFORMATION SESSIONS

Under the current phase of EIS development, the EIS team will be holding several information presentations on the EIS, giving practical demonstrations on how to use it. These are currently planned for tertiary education students and other interested groups.

Please use the **Contact Us** or **Forum** button to request a demonstration at your institution or to make your opinions known about any aspect of the EIS.

And finally, THANK YOU to Internet Technologies Namibia for their generous sponsorship of the hosting of the EIS for 3 years.



Number of records in the EIS: Over 6,030

GENEROUS FUNDING FROM THE ENVIRONMENTAL INVESTMENT FUND OF NAMIBIA

"Flight paths for wetland flagships" project

In collaboration with the Namibia Crane and Wetlands Working Group (www.nnf.org.na/CRANES.htm), we are proud to report that our application to the Environmental Investment Fund (EIF) of Namibia for a project entitled "Flight Paths for Wetland Flagships" has recently been approved. The EIF has granted an amount of N\$311,080 over two years, with match funding for a total of N\$254,500 mainly from the NamPower/NNF Strategic Partnership and the Nedbank Go Green Fund (see previous issue No. 7, May 2011 for further details) and supported by the Ministry of Environment and Tourism.

The overall **goal** of the project is to track the flight paths of flagship wetland bird species in order to address major conservation issues outside protected areas.

The **objectives** are to:

1. Track the flight paths of flagship wetland bird species, namely Lesser Flamingos, Greater Flamingos and Blue Cranes;
2. Investigate the seasonal and local abundance of flamingos, and continue to monitor numbers and breeding success of Blue Cranes;
3. Investigate the mitigation of power lines on identified flamingo flight paths; and
4. Publicise the results to promote awareness of the plight of these flagship wetland bird species.

Why do we need this project?

Large birds such as flamingos and cranes are universally regarded as flagships for wetland conservation. Unfortunately these species are not confined to protected areas. Nomadic migratory species may encounter threats in unprotected areas, including snaring/hunting or collisions with fences and power lines. As an aid to mitigating these problems, there is a need to determine the flight paths of flagship wetland bird species more precisely so that problem areas can be identified and targeted for further action.

Because of the expense of applying mitigation measures to both old and new power lines, it is necessary to establish flamingo flight paths in order to investigate specific sites/routes for mortalities; to confirm whether there is a problem or not and, if so, the scope of the impacts; and to feed the information to power line planners and EIA practitioners in terms of planning for new power lines. With the expansion of mining and other developments on the coast of Namibia and the associated increase in the need for power, this aspect is particularly pertinent, in order to promote sustainable development. It is also imperative to establish conclusively exactly how many Blue Cranes remain in Namibia; and which areas they move to when they leave Etosha, so that awareness



Flamingos flying low in the Kuiseb Delta. Both Greater Flamingo and Lesser Flamingo are *Vulnerable* Red Data Book species in Namibia; Lesser Flamingo is also *Globally Near-threatened*. Generous funding to track the flight paths of such wetland flagships will promote the development of effective mitigation measures for collisions on power lines (photo Susann Kinghorn).

efforts to address threats can be focussed amongst the local communities involved.

The increasing public interest in these flagship species is also having a ripple effect on environmental conservation in broader terms, to the benefit of these communities, in terms of the long term sustainability of the habitats they live in and are dependent upon for survival.

The EIF grant is in the process of being handed over, and we look forward to bringing you further news of this exciting ground-breaking initiative in our next issue.

Our sincere thanks to all our donors and supporters for their invaluable financial and other contributions to these projects!



NamPower/NNF Strategic Partnership



TRACKING FLAMINGO FLIGHT PATHS FROM THE GROUND

Theresa & Joh Henschel [henschel.thatcher@iway.na]

Background

The Lesser Flamingo and Greater Flamingo occur seasonally in large numbers on the Walvis Bay Lagoon and Sandwich Harbour Lagoon, annually moving to/from Makgadikgadi Pan in Botswana, and to/from Etosha Pan, where they breed. Several observations suggest that their movements primarily occur at night and along linear structures and features. Additionally, confirmed (incidental) reports of mortalities on power lines suggest that one of the routes they may follow is via Okakuejo-Outjo-Khorixas-Uis-Henties Bay on their way between Etosha and the coast; further mortality data also suggest a route east of Etosha, towards Nyae Nyae pans in Bushmanland. The actual routes followed are believed to vary from year to year, according to environmental conditions. They are known to breed at the inland pans (Etosha and Makgadikgadi), when these are filled following rains in the southern African interior, and they spend the rest of the year at the coastal lagoons to feed, but do not breed there. It is thought that these major inland pans and coastal lagoons are all of critical importance for flamingo populations, because no single water body can cover all the needs of these birds.

An important conservation management process is to ensure that these different ecological support zones are interconnected through appropriate corridors. For the flamingos, this implies that their flight paths are not obstructed and do not pose undue risks to their populations during migrations. Flamingos' apparent habit of flying in groups along linear structures at night (such as ephemeral water courses or roads) makes them especially prone to colliding with power lines that cross their path, which is often fatal for these large, long-necked and long-legged birds.

Objectives

It is therefore important to have better knowledge of the migration pathways and behaviour of flamingos as well as what cues are important for their movements to reduce risks of mortality. This project therefore sets out to elucidate the spatial and temporal characteristics of migration behaviour, including season, time of day/night, duration of flight, height of flight, weather conditions, size of flamingo groups, resting stations and guiding features of landscape. The project will also improve knowledge on how flamingos can detect power lines and other infrastructure at night and thus avoid collisions, so that the infrastructure can be routed and designed in order to minimise collisions.

The NamPower/Namibia Nature Foundation Strategic Partnership has initiated the Namibia Flamingo and Power Line Project, with co-funding from the Nebank Go Green Fund (see above). The present initiative is a sub-project of



Bird watchers provide essential information for tracking flamingo movements from the ground (*photo CETN*).

the above project, which it seeks to support in terms of providing additional substantiated data for determining flamingo flight paths in Namibia, as well as promoting awareness on flamingos and their conservation.

The project is being funded jointly by the Nedbank Go Green Fund and the NamPower/NNF Strategic Partnership.

Methods

1. **Analyse existing bird count data** in order to establish seasonal and annual abundance of flamingos in different localities in Namibia, to support results of satellite telemetry in terms of determining migration periods and flight paths; correlate the results with annual rainfall as a means of predicting movements.
2. **Gather anecdotal records of flying flamingos** observed away from wetlands, employing a questionnaire to collect preliminary information on flamingo flights (date, time, approx. no. of birds, flying height & direction etc.)
 - Theresa Henschel will coordinate the publicity, communication with the network, serve as node for the flamingo "flight alert", and receive and collate data from informants and provide this to the project team for analysis and interpretation.
 - Participants will be identified through publicity and by telephonic/email communication with prospective informants, specifically also targeting geographic gaps, i.e. potentially important areas where informants have not been forthcoming. An effort will be made to include landowners, power utility and mines staff and the media.
 - From the participants, a network of reliable informants will be established, especially along the potential flight routes identified in the preliminary investigation. This network will also serve to give early-warnings. New observations will be reported onto data sheets by the network of informants during the flamingo migrations. The ongoing interest of the participants will be maintained by regular communication and feedback.

3. Promote awareness on flamingos and their conservation

- Theresa Henschel will compile information for awareness materials and will arrange for their publication or placement/distribution, following the planning and agreement of the project team. Among these activities will be to:
 - Produce a 1-page leaflet with essential information on the project
 - Establish a flamingo flight-path web page on the EIS (www.the-eis.com), in collaboration with Alice Jarvis
 - Produce a quarterly informal electronic newsletter on the project for participants, and feed into the newsletters of the NamPower/NNF Strategic Partnership, and Namibia Crane & Wetlands News

The project advisors will include the Partnership; Dr Joh Henschel; Holger Kolberg and Wilferd Versfeld (MET); and other members of the satellite tracking team on an *ad hoc* basis.

The outputs of this project include:

1. Substantiated information on the flight paths of flamingos in Namibia.
2. Increased publicity and awareness of flamingo conservation that will assist with raising incident reporting levels, and promote proactive mitigation of power lines.

You can help!

Kindly contact Theresa Henschel at the above email address if you would like to participate in this important project.

NAMPOWER WEAVER BIRDS PROJECT

Julia Amukwa [amukwajulia@yahoo.com]

One of the actions identified in the Partnership's Bird and Power Line Action Plan (see issue No. 7, May 2011, pp 3-4) is to initiate research into interactions between Sociable Weavers and Red-billed Buffalo-Weavers on power lines, with a view to addressing the negative impacts of nesting on the power supply by developing/ testing appropriate mitigation methods.

We are pleased to report that NamPower has appointed a Namibian student, funded by a bursary, and that work is in



progress. We asked Julia to tell us about herself and her project.

Julia Amukwa (left) was born in northern Namibia and matriculated from Ruacana High School in 2008. She was second best in Omusati Region in High Level grade 12 exams and third best in the country after her grade 10 national Junior Secondary Certificate (JSC) exams in 2006.



Above: The availability of water near a homestead has apparently attracted many Sociable Weavers to this site, resulting in persistent nesting on insulators which causes short circuits/outages; the regular removal of these nests necessitates a round trip of 320+ km from Gobabis by NamPower personnel every week.

Below: Colonial nesting by Red-billed Buffalo-Weavers in the north may create a hinderance to carrying out maintenance work on pylons (*photos Ann Scott*)

She studied her undergraduate degree at the University of Pretoria with a bursary from NamPower. She is currently doing her Honours in Environmental Analysis and Management at the same institution, after being awarded a post-graduate scholarship from NamPower earlier this year.

Julia is one of the few students who are highly passionate about Environmental Sciences, a unique position of being in both the natural and human sciences, fundamental to dealing with multidisciplinary and complex environmental issues. She considers herself very lucky to have great mentors in the field across the globe, to be working with internationally recognised professors and other post-graduate students. Last year Julia was involved in volunteer work with the South African National Biodiversity Institute (SANBI), doing data analysis for The Red List of South African plants, which was the first time that any of the world's mega-diverse countries has fully assessed the status of its entire flora.

Julia's postgraduate work involves two weaver species, the Sociable Weaver (*Philetairus socius*) and the Red-billed Buffalo-Weaver (*Bubalornis niger*). The two species are endemic to southern Africa; and are famous for building huge communal nests on power lines in the region. Their nesting behaviour greatly interrupts power supply, rocketing the costs of maintenance and repair of power lines for NamPower and other power producing companies. Julia will look at ways of mitigation for the nesting of the two birds in particular. The project is scheduled for three years, including a two-year Master's study also funded by NamPower. The aim of the project is to find efficient and cost effective methods of mitigation, to reduce significantly or eliminate the negative impacts of the birds' nests on power supply.

The two main objectives are as follows:

1. Spatial analysis of birds, power lines and environmental data to understand nesting behaviour and requirements of the two species
2. Identify mitigation measures

It is important to note that Julia's project is not on the birds' ecology or how they are affected by the power lines, but rather on how to reduce the impacts of their nesting on these structures.

Julia is eager to return to Namibia after her studies and to join a team of others willing to work towards sustainable economic development and conservation of the country's resources.

NAMPOWER INITIATES DUMMY POLE MITIGATION TRIALS IN THE SOUTH

Pieter Cloete [Pieter.Cloete@nampower.com.na]

ED: Nesting by Sociable Weavers (Versamelvoëls) causes disruptive outages when the nesting material becomes wet, causing a short circuit. "Dummy poles" have been used with success to entice the birds away from their original nesting sites (see newsletter No. 8, p6). This innovative technique is now being implemented on a large-scale experimental basis in the South.

We started with the project in March, April and May 2012.

In total we planted 50 dummy poles on three different lines. We used scrap poles from the old Aranos 66 kV line, which became available when they built a new line. The team consisted of Hans Peens, Pieter Cloete, Craig Cupido, Jasson Iyambo (Supervisor in charge), J Erastus, P Bernadino, P Ndjambula, W Shikongo, J Haman in cooperation with Danie Louw (SHEW Department).

We planted 10 poles on the Koes 33 kV retic. Many power outages occur on this line due to bird nesting on poles. We will plant more in future. On the Aroab /Kiris retic. we planted 20 dummy poles.

We also planted 20 dummy poles on the Rietfontein 33 kV line. With Rietfontein is a 66 KV line structure. We put on lightning poles plus dummy poles for bird nesting, so they have a dual structure. When a bird's nest is built on these

66 kV structures the lightning will strike and nest will catch fire. The pole structure will burn down and cause outages of up to 24 hours as distance and labour hours play a role to replace the structure.

On most dummy poles the birds have moved. It's an ongoing process and we will plant more poles as funds become available. We visit the poles every week now to remove new bird nesting material from the old poles.



Top and centre: Dummy poles placed next to the Koes 33 kV retic. line.

Bottom: Dummy poles fitted with lightning conductors next to the Rietfontein line (photos Pieter Cloete).

BUSTARD AND POWER LINES PROJECT

Upcoming project: Collisions of large flying birds, especially bustards, with power lines in Namibia – significance and possible solutions

John Pallett [john.pallett@saiea.com; cell 081 240 252]



An outcome of the Strategic Partnership is NamPower's support towards an MSc project to gather hard data on bird collisions with power lines. I had been itching to get started with power line fieldwork since the Partnership was founded, so immediately took the "foolhardy" step to commit fully to this project.

Work in the Karoo has shown that, in areas frequented by bustards, collisions occur at a rate of about one bird per kilometre of power line per year. That's a worryingly large number of birds!! Is the Namibian situation the same? – preliminary data from *ad hoc* surveys suggests it could be. Prof. Peter Ryan, who runs the Conservation Biology MSc course at the Percy FitzPatrick Institute for African Ornithology at the University of Cape Town, and supervises a "sister" PhD project by Jessica Shaw, currently taking place in the Karoo, has offered helpful advice to the design of the Namibian project. In short, I intend to conduct surveys on four different types of power lines, covering about 100 km of each line, four times per year. The power lines are all clustered in the area south and west of Keetmanshoop. The target species for the surveys will be Ludwig's Bustard and Kori Bustard, as well as any other large birds encountered.

The results from this monitoring will be used as a baseline when we experimentally test various designs to reduce collisions, in the second phase of the project. Bustards are large, heavy fliers with poor manoeuvrability, and it has recently been shown that they don't actually look where they're going when in flight! When looking downwards from the air, their scope of vision is blind to the front, which gives visual bird diverters (mitigation devices) less chance of successfully reducing collisions. The situation is made more difficult by the fact that these birds tend to roam nomadically, not following regular flight paths, and often fly in the half-light of dawn and dusk.

The project will probably go on for three years, starting in July 2012. I will be assisted by Allen Kafene who has shown an interest in the work since its inception. We would like to hear of any sightings of large concentrations of bustards – please contact me at the address above. We hope also to enlist volunteers for censussing Namibia's total populations of both bustard species, to put the power line mortality rates into context.



Jess Shaw, Ph.D student at UCT, recording details of a Kori Bustard collision in the Karoo, SA, with the 220kV power line overhead (photo John Pallett).

LUDWIG'S BUSTARDS BREEDING NEAR LÜDERITZ COAST

Jessica Kemper [jkemper01@gmail.com]

We had a very wet year in 2011, although it did not rain for long periods like it did elsewhere in Namibia, but only had two notable rain events, especially the deluge on 1/5/11 with about 50mm in 24 hours (average annual rainfall here is 14-16mm). The desert got thoroughly soaked and subsequently flowered for months on end, accompanied by tons of corn crickets. The vegetation is now dying off again, the grass is past its prime, the crickets have all but disappeared and for the last two weeks the bustards have become more sparse, although I still see new tracks every couple of days.

After these good rains, we've had lots of Ludwig's Bustards in the Lüderitz area, right up to the sea and I even found evidence of three nests close to the coast. The one was an unflighted chick, which dashed off on foot too quickly for me to get a photo. The other two suspected nests were two sets of egg shells (suspected to stem from one egg per site). The one looked like it could have recently hatched; the other pile was more broken and I am not sure whether it was a case of broken/predated egg or hatched egg. There were between three to seven adults always in the area where I found the two egg shell piles for about two months and about two weeks later a friend saw two "youngsters" in a group of LBs close to Diaz Point. I did see another suspected unflighted chick on the peninsula in the general vicinity of where I had the other sightings just before the birds disappeared from the peninsula. I didn't get a good look at the bird, but it left tell-tale Ludwig's Bustard tracks in the soft sand, so I am pretty sure it was one. It's quite a challenge to get decent photos of these birds, as they are quite shy around here and fly off as soon as they spot you.

UNDERSTANDING BIRD COLLISIONS WITH MAN-MADE OBJECTS: A SENSORY ECOLOGY APPROACH

Graham Martin [g.r.martin@bham.ac.uk]

Abstract: (Ibis [2011], 153, 239–254):

Sensory ecology investigates the information that underlies an animal's interactions with its environment. A sensory ecology framework is used here to seek to assess why flying birds collide with prominent structures, such as power lines, fences, communication masts, wind turbines and buildings, which intrude into the open airspace. Such collisions occur under conditions of both high and low visibility. It is argued that a human perspective of the problems posed by these obstacles is unhelpful. Birds live in different visual worlds and key aspects of these differences are summarized. When in flight, birds may turn their heads in both pitch and yaw to look down, either with the binocular field or with the lateral part of an eye's visual field. Such behaviour may be usual and results in certain species being at least temporarily blind in the direction of travel. Furthermore, even if birds are looking ahead, frontal vision may not be in high resolution. In general, high resolution occurs in the lateral fields of view and frontal vision in birds may be tuned for the detection of movement concerned with the extraction of information from the optical flow field, rather than the detection of high spatial detail. Birds probably employ lateral vision for the detection of conspecifics, foraging opportunities and predators. The detection of these may be more important than simply looking ahead during flight in the open airspace. Birds in flight may predict that the environment ahead is not cluttered. Even if they are facing forward, they may fail to see an obstacle as they may not predict obstructions; perceptually they have no 'prior' for human artefacts such as buildings, power wires or wind turbines. Birds have only a restricted range of flight speeds that can be used to adjust their rate of gain of visual information as the sensory challenges of the environment change. It is argued that to reduce collisions with known hazards, something placed upon the ground may be more important than something placed on the obstacle itself.



Did this Kori Bustard actually see the power line it has just crossed, or did it fall within its "blind spot"?
(photo A.C. van Zyl)

Foraging patches, conspecific models or alerting sounds placed a suitable distance from the hazard may be an effective way of reducing collisions in certain locations. However, there is unlikely to be a single effective way to reduce collisions for multiple species at any one site. Warning or diversion and distraction solutions may need to be tailored for particular target species.

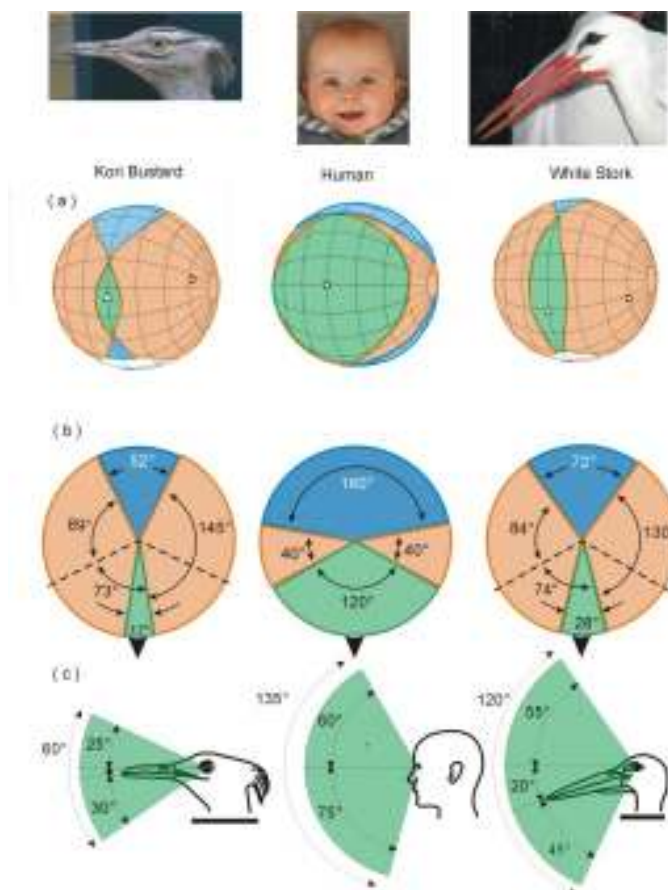


Figure above: Visual fields in Kori Bustards, humans and White Storks. The differences between a 'human eye view' and a 'birds' eye view' are readily apparent from these diagrams. Bustards are particularly prone to collisions with power lines of the kind depicted on page 7. Storks, although vulnerable to collisions with such power lines, are more likely to be electrocuted by low-tension power wires (because their wide wing span is sufficient to earth between two current-carrying wires in low-tension power transmission systems). The figure is a matrix that allows interspecific comparison of the same information across rows, while columns show information for each species.

Row (a): perspective views of orthographic projections of the boundaries of the retinal fields of the two eyes and in the birds the line of the eye–bill tip projections (indicated by a white triangle). The direction of the optic axes of the eyes is indicated by a white pentagon. The diagrams use conventional latitude and longitude coordinate systems with the equator aligned vertically in the median sagittal plane of the head. The grid is at 20° intervals. It should be imagined that in each diagram the head is positioned at the centre of a transparent sphere with the field boundaries and optic axes projected onto the surface of the sphere with the heads in the orientations shown in row (c). **Green areas, binocular sectors; pink areas, monocular sectors; blue areas, blind sectors.**

Row (b): horizontal sections through the visual fields in a horizontal plane defined by the straight line running through the middle of each of the visual field projections shown in row (a). Dashed lines indicate the directions of the optic axes. In the birds, the axis of each eye projects laterally, in humans, the optic axes of each eye project forward and coincide (colour coding of each sector of the visual fields as in row (a)).

Row (c): vertical sections through the binocular fields (green) in the

median sagittal plane defined by the vertically oriented equators of the diagrams in row (a). The line drawings of the heads of the birds show them in the approximate orientations typically adopted by the species in flight. In humans, the head is in a typical upright posture. The visual fields are presented with respect to these typical head positions. Key features of visual fields in birds that forage using visual guidance are shown in the case of the bustards and storks. **These are features typical of the majority of bird species** (Martin 2007). **The eyes project laterally and the best optical quality and the direction of best resolution projects laterally. The binocular field is narrow and vertically long with the bill projecting approximately centrally; there is extensive visual coverage by each eye to the side and behind the head, resulting in a small blind sector above and to the rear of the head.** In humans the visual field is arranged very differently from those of the two birds. The eyes project forwards and almost the whole of the visual field is binocular, there is a large blind area behind the head and the best optical quality and highest resolution lie directly ahead. **One crucial difference between the two bird species depicted here lies in the vertical extent of their binocular fields and the effect of moving the head on visual coverage of the frontal hemisphere.** In bustards, a relatively small forward head pitch of 25° (rows a and c) is sufficient to bring the extensive blind area above the head to project forwards in the direction of forward travel. However, in storks, visual coverage of the frontal field is not abolished until the head has pitched forward by 55°, which would mean that the bill is pointing vertically downwards. This amplitude of head movement that is necessary to abolish forward vision is similar to that required for the same effect in humans. The visual field of bustards is similar to those found in cranes and eagles, which are also highly vulnerable to collisions with artefacts. The visual field of storks is similar to those found in other members of the Ciconiformes and in duck species (Martin 2007). The figure is based upon Martin and Shaw (2010).

VISUAL FIELDS, FORAGING AND COLLISION VULNERABILITY IN *GYP*S VULTURES

Graham Martin, Steven Portugal & Campbell Murn

Abstract: (Ibis [2012], doi: 10.1111/j.1474-919X.2012.01227.x)

<http://www.nature.com/news/vultures-blind-to-the-dangers-of-wind-farms-1.10214>

The visual fields of vultures contain a small binocular region and large blind areas above, below and behind the head. Head positions typically adopted by foraging vultures suggest that these visual fields provide comprehensive visual coverage of the ground below, prohibit the eyes from imaging the sun and provide extensive visual coverage laterally. However, vultures will often be blind in the direction of travel. We conclude that by erecting structures such as wind turbines, which extend into open airspace, humans have provided a perceptual challenge that the vision of foraging vultures cannot overcome.

VISUAL FIELDS IN FLAMINGOS: CHICK-FEEDING VERSUS FILTER-FEEDING

Graham R. Martin, Nigel Jarrett, Phillip Tovey, Craig R. White

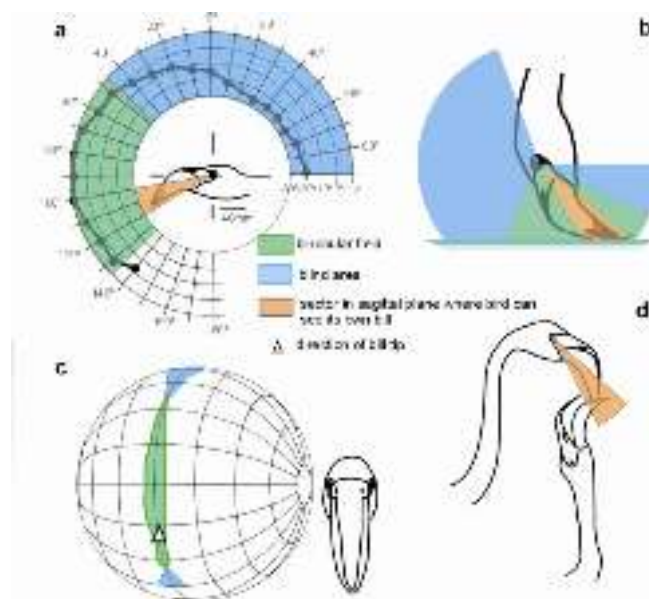
Abstract: Naturwissenschaften (2005) 00

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In birds, the position and extent of the region of binocular vision appears to be determined by feeding ecology. Of prime importance is the degree to which vision is used for the precise control of bill position when pecking or lunging

at prey. In birds that do not require such precision (probe and filter-feeders), the bill falls outside the binocular field, which extends above and behind the head, thus providing comprehensive visual coverage.

Flamingos Phoenicopteridae are highly specialised filter-feeders. They employ a unique technique that does not require accurate bill positioning in which the inverted head is placed between the feet. Feeding flamingos often walk forwards with the head pointing “backwards”. Here we show that in Lesser Flamingos *Phoeniconaias minor* visual fields are in fact the same as those of birds that feed by precision pecking and that feeding flamingos are blind in the direction of their walking. We suggest that this is due to the requirement for accurate bill placement when flamingos feed their chicks with “crop-milk”, and possibly when building their nest. We propose that chick-feeding may be the ultimate determinant of visual field topography in birds, not feeding ecology.



Caption for figure: Visual fields and feeding in Lesser Flamingos. (a) The width of the binocular field (shaded green, positive values) and the width of the blind area (shaded blue, negative values) as a function of elevation in the median sagittal plane. The region in which the bill defines the limits of the frontal field, and hence can be seen by the bird, is indicated by orange shading. (b) Head posture adopted by a feeding Lesser Flamingo. The head is inverted and the bill just enters the water surface. Yellow shading indicates the position of the blind area above and behind the head and shows that a feeding flamingo cannot see directly ahead of itself when moving forwards. (c) Perspective view of an orthographic projection of the binocular field as projected onto the surface of a sphere surrounding the bird’s head. The grid shows conventional latitude and longitude at 20° intervals and the median sagittal plane of the bird’s head is in the plane of the equator (which is vertical). The head is in the same posture as depicted in a and is shown in frontal view in the drawing to the right of the grid. The frontal binocular field is vertically long but narrow with the bill tip projecting in its lower half. (d) Adult Flamingo feeding a chick (8–10 weeks

old) by dripping crop milk directly into the chick's open bill. The bill tips meet precisely and the shaded area indicates the section of the binocular field in which the adult can see its own bill tip (drawing traced from a photograph).

Graham Martin comments on the vulnerability of flamingos to power line collisions:

Flamingos have extensive visual coverage of the frontal hemisphere. So when they are flying, if they pitch their head forward to look down they will still maintain coverage of the way ahead (unlike the bustards, carnes, vultures). However, I do not know anything about what they might see a low light levels. I suspect their collision vulnerability will arise (as in wildfowl) in the fact that they fly regularly at dusk and dawn under low light level conditions. At this time the visibility of objects will be low due to their lowered acuity at low light levels (as in most vertebrates that function over a wide range of light levels), and also because of the possibility of mist, etc.

Also they tend to fly in groups. This means that individual birds may not be keeping a look out ahead so if one or two leading birds make a mistake or misjudgement then the problem can be multiplied, or if leading birds deviate to avoid an obstacle at the last moment this may not give enough time for course corrections by those following. collision vulnerability of flamingos.

Ed: Also that they may be flying along probably ancient migratory paths (such as ephemeral rivers), where a power line would present an unforeseen obstruction.



UN WILDLIFE MEETING PUSHES TO MAKE POWER LINES SAFER FOR BIRDS

International reports address impact of power lines on migratory birds, offering solutions to avoid collisions and electrocution

[africanraptors@yahoo.com]; on behalf of **James Wolstencroft** [gonolek@gmail.com]; (Ed: adapted)

Bergen, 24 November 2011: Two new international reports on the conflict between migratory birds and power lines in the African-Eurasian region were presented to delegates at a UN wildlife conference that took place 20-25 November 2011 in Bergen, Norway.

The two documents, *The Review of the Conflict Between Migratory Birds and Electricity Power Grids in the African-Eurasian Region* and the *Guidelines on How to Avoid or Mitigate the Impact of Electricity Power Grids on Migratory Birds in the African-Eurasian Region* will be reviewed by representatives from close to 100 governments and several key wildlife conservation organizations attending the Conference of the Parties to the Convention on the Conservation of Migratory Species of Wild Animals (CMS), an international wildlife treaty administered by the United Nations Environment Programme (UNEP).

Power lines constitute one of the major causes of unnatural death for birds both through electrocution and fatal collisions. At end of 2010 there were 70.5 million kilometers of power lines throughout the world, constructed with minimal consideration for their environmental impact. This is expected to increase to 76.2 million kilometers by the end of 2015.

The review shows that in the African-Eurasian region alone, hundreds of thousands of birds die annually from electrocution and tens of millions of birds from collision with power lines. Large birds seem to be more affected.

For some large, slow reproducing bird species which migrate across this region, such as pelicans, storks, flamingos, birds of prey, cranes, bustards and owls, the death toll could possibly lead to population declines and/or local or regional extinction.

In South Africa, for example, 12% of Blue Cranes, South Africa's national bird, and 11-15% of Ludwig's Bustards are dying annually in collisions with a growing number of power lines.

According to the review, hot spots for electrocution are especially found in open habitats lacking natural perches or nesting trees for the birds, such as steppes, deserts and wetlands. Bird collisions, on the other hand, occur in every habitat type in the region, with hotspots, for example, located in areas where large numbers of birds congregate, such as near water bodies or in migration corridors.

The international review presents a current overview of the existing research and corrective measures undertaken by some countries and electricity power companies in the region to avoid bird mortality from collisions and electrocutions by power lines.

The guidelines contain a set of concrete recommendations for governments, electric power companies and conservation organisations on how to avoid and reduce the impact of electricity power grids on birds.

LINKS:

CMS COP10 Media Page

<http://www.cms.int/bodies/COP/cop10/media.htm#4>

The Guidelines (incl. Executive Summary)

http://www.cms.int/bodies/COP/cop10/docs_and_inf_docs/doc_30_electrocution_guidelines_e.pdf

The International Review

http://www.cms.int/bodies/COP/cop10/docs_and_inf_docs/inf_38_electrocution_review.pdf

Link to the review & guidelines project website

<http://www.buwa.nl/en/aewareviewproject.html>

NAMIBIA BIRD NEWS

Holger Kolberg [nambirdnews@gmail.com]

There is a new bird newsletter available for Namibia!

You can download it for free from this link:

<http://www.namibiabirdclub.org/newsletter.html>

Please send this link to as many friends/colleagues as you want. All contributions welcome!

POWER LINE SURVEYS

Trekkopje-Wlotzka lines: surveys by AREVA

(see newsletter No. 8, p3 for first survey on 24/8/11)

Locality: Trekkopje Mine to Wlotzkasbaken desalination plant on the coast: Trekkopje "bypass" line and Trekkopje-Wlotzka, capacity: 66 kV, 220 kV and 132 kV.

Start S0497062 E7552091 (S22 0810.1 E14 5809.5) /

End S442616 E752896 (S22 2221.1 E14 2632.2).

Distance: 68.5 km, mainly driving but walking 10 (random) spans.

Habitat: Moderate-sparse vegetation cover, gravel plains, dry washes.

Participants: Kaarina Nkandi [kaarina.nkandi@areva.com], Annina van Neel, Richard Gurirab, Helmuth Ochurub – all AREVA staff; (joined by Ann & Mike Scott on 9/5/12).

Results:

24/8/11: No dead or injured birds observed during the survey. Few live birds were observed flying under or in the vicinity of the power line.

26/9/11: No dead or injured birds observed during the survey. A number of birds were observed flying under or in the vicinity of the power line.

27/10/11:

- No factual carcass or injured birds observed during the survey.
- Numerous of feathers appear to be remains for one bird observed below 66kV line.
- Two feathers, one with blood stain were observed next to the 132 kV power line.
- A number of birds were observed flying under or in the vicinity of the power line mainly at the mine side.

28/11/11 & 1/12/11: No dead or injured birds observed during the survey. A number of birds were observed flying under or in the vicinity of the power line.

Several crows were sighted on the NE side of the mine, whereas fewer birds were sighted further west, along the desalination pipeline.

Feathers observed at S0469777; E7542867: a scatter of feathers (Namaqua Sandgrouse) was found under the power line, next to the desalination substation. Flocks of Namaqua Sandgrouse were spotted flying and gathering where the pump station is leaking, an established water point for the birds.

The position of the power line between the substation (water point) on the northern side and hills on the southern edge, could be a contributory factor to bird incidents in this section of the power line-blind spot.

28-29/2/12: No dead or injured birds observed during the survey. A number of birds were observed flying under or in the vicinity of the power line.



Top: Helmuth Ochurub points out the locality where Namaqua Sandgrouse feathers were found in December 2011 in an area frequented by flocks of these nomadic birds;

Centre: Remains of a Ludwig's Bustard, found near the 66 kV line on 27/10/11;

Bottom: Interesting sightings of other birds during the surveys: Greater Kestrel, a nest used both by these birds and crows; and a Helmeted Guineafowl (photos Kaarina Nkandi).



Above: The survey on 10/5/12 was carried out by (L to R) Kaarina Nkandi, Mike Scott, Helmuth Ochurub, Richard Gurirab & Ann Scott (*photographer*). Photos below show the remains of a Ludwig's Bustard, and of a flamingo.

10/5/12: Survey done as part of bird identification training (offered by the Partnership: Mike & Ann Scott).

Hot and eastern wind conditions.

Six incidents were observed during the survey, including two Ludwig's Bustard fresh carcasses, two with numerous feathers and bones for Ludwig's Bustard and two incidents were bones and feathers for flamingos.

This is a first time such a high number of incidents was recorded for Ludwig's Bustard on one day, the eastern wind conditions experienced during the week could be a contributing factor which can be related to the low visibility of lines, or impact that the wind strength imposes on the birds.

Rosh Pinah – Lüderitz 66 kV line* I

Coleen Mannheimer [manfam@iafrica.com.na]

**Note that this line is not energised*

Date: 17/8/11

Locality: S26 47.751 E15 40.512E (S26 47'36.77" E15 40'27.83"), south of Tsaukaib to S27 0.977 E15 56.420E (S27 00'30.66" E15 56'44.02"), just before Agub.

Results (note that this was not a dedicated survey): incidental observations of collisions/mortalities of more than 20 Ludwig's Bustard. Freshness of carcasses: unknown, but lots of feathers still present and it is a very windy zone. There are lots of jackals there, and probably hyaena too.

I saw about 10 live pairs of Ludwig's Bustards in close proximity to the line. They took off and flew just over the line when we approached. I think the carcasses could not be very old, because the feathers would long ago have blown away in that area if the remains were old. It is very windy indeed. The line is not energised. The area where I saw the mortalities was between Tsauhaib and Tsaus.

Rosh Pinah – Lüderitz 66 kV line* II

Mike & Ann Scott (NP/NNF Partnership); **Michael Tjikune** (NamPower)

**Note that this line is not energised*

Date & time: 9/9/11, 08h20 - 14h35

Locality: Tower 1058 – 883 (travelling southwards); Start: S26 43.016 E15 23.985; End: S26 49.353 E15 43.539 Total: 36 km

Habitat: Desert – gravel plains and rocky outcrops; seasonal grass and plant cover due to good rains.

Motivation for survey: see above report from Coleen Mannheimer (17/8/11). These findings were cause for concern, and a dedicated survey of the power line was regarded as a priority.



Google image showing detail of section of power line surveyed (between green markers); incidents recorded (red markers); start of initial area of concern reported by C. Mannheimer (yellow marker (based on a Google map generated by EIS 2011). Note how power line crosses potential bustard flightpaths along dry water courses/washes running from north-east to south-west.



Top: The survey team included (L to R) Mike Scott, Michael Tjikune and Ann Scott (*photographer*).
 Bottom: Remains of bustards found beneath the Rosh Pinah – Lüderitz 66 kV line.

Results: Remains of 24 collision incidents involving Ludwig's Bustard, including at least two incidents involving more than one bird. Sixty-five live Ludwig's Bustards were observed (including at least one juvenile). The birds were seen flying up and down dry watercourses; flight low and clumsy, sometimes just clearing power lines, sometimes flying beneath lines. Bustards were recorded in areas with green flush of grass and other vegetation after good rains. Signs of active scavenging by jackals: only a few bones remained of all the carcasses; heads and beaks, legs, wings and feet were all eaten. Piles of feathers that were found were in most cases fresh and, given the high scavenging rates, it is concluded that the incidents were recent.

Recommendations:

The above pattern of collisions involving an extremely large number of mortalities is of critical concern. As scavengers may have removed whole carcasses, these figures are considered to represent minimum numbers of collisions.

The above findings justify a much expanded monitoring survey of the total length of the line, and of other lines in the bustard distribution area, in order to obtain some idea of the greater impact through large sample sizes, as well as any geographic trends.

Recommendations include a further dedicated survey of the entire Rosh Pinah-Lüderitz 66 kV line, supplemented by additional surveys of other lines throughout the

Ludwig's Bustard distribution range. Largely as a result of these findings, an MSc research project on bustards and power lines has been initiated (see p 7).

Mitigation should be applied in identified problem areas as soon as possible. The above initial surveys should be followed up with regular monitoring surveys, and the promotion of awareness about the problem and reporting method to NamPower staff, Namdeb, MET staff and other stakeholders in the area.

Acknowledgements: We thank Michael Tjikune for his willing assistance with the field work; Hans Peens, Danie Louw and Karl-Heinz Wagner (NamPower) for facilitating the survey; and Karen Siebers of Namdeb for her assistance with the permits. Coleen Mannheimer is thanked for drawing our attention to the problem. NamibRand Nature Reserve kindly made a vehicle available for the field work.

Etosha east: Otjikoto – Oshivello 132 kV line

Hendrik Espag & Johannes Shiimi

[Hendrik.Espag@nampower.com.na], Mike & Ann Scott (NP-NNF)

Date & time: 10/10/11, 09h30-11h30

Locality: Omuramba Owambo area east of Etosha; south of Oshivello. A 22 kV HPCD line runs east of the Otjikoto-Oshivello 132 kV line.

Start S18 46.005 E17 15.925, End S18 37.324 E17 10.97 18 km (Tower OK OKT 220-282)

Habitat: Dense bush and trees; the large Omuramba Owambo runs west-east, with several smaller pan-areas (all dry at present, but likely to collect rain water during the wet season).

Motivation: A collision event involving 20± flamingos on the Gerus-Zambezi 350HVDC transmission line north-east of Grootfontein, between Tower 472 (-19.3218S 18.5317E) and 491 (-19.2457S 18.5895E), was reported on 2/11/09 (see newsletter No. 4, June 2010). The collision site lies on a suspected flight path for flamingos between Etosha and Nyae Nyae Pans, near Tsumkwe in Bushmanland.



The survey area (between two yellow markers) east of Etosha (after a Google map generated on the EIS).

The Otjikoto-Oshivello 132 kV line also crosses this suspected flightplath for flamingos, and possibly for (Blue) Cranes, along the large Omuramba Owambo that runs west-east from Etosha to Nyae Nyae Pans. The Omuramba and associated pans may gather rain water during the wet season and create a potential temporary habitat for birds, including migrating species.

Results: No signs of collision or electrocution incidents were found. Seven single large feathers were found (including 2x Guinea fowl, 1x Black-chested Snake-Eagle) – possibly related to birds preening while perched?



Top: The large Omuramba Owambo runs west-east and is intersected by the 132 kV power line at this point (S18 38.334 E17 11.408).

Bottom: The survey team included (L to R) Mike Scott, Johannes Shiimi, Hendrik Espag & Ann Scott (*photographer*).

Aries-Kokerboom 400 kV line

R. (Dagga) Zimmermann & Lomar Electro Services
[dagga.zimmermann@nampower.com.na]

20/11/11

Aries-Kokerboom 400 kV near Ariamsvlei

Start: Pole no. 33

Habitat: Rocky environment with very little vegetation.

Results: 1 dead **bustard** found beneath line; power line collision.

24/11/11: 07h00-17h00

Aries-Kokerboom 400 kV near Ariamsvlei

S27.84636 E019.3500; Start: Pole No. 184/185

Habitat: Rocky environment with very little vegetation and no water

Motivation: Refurbishment of 400 kV tower anchors

Results: 1 dead **eagle**; power line collision (position as above)

26/11/11: 07h00-17h00

Aries-Kokerboom 400 kV near Karasburg

S27 76.249 E19 27.123

Habitat: As above.

Motivation: As above.

Results: 1 dead **vulture**; power line collision (position as above)

Büllsport private 33 kV HPCD line (parallel to D854)

John Pallett [john.pallett@saiea.com]

Date & time: 7/4/12

Start (cycle): 15h20-16h05; Return (walk): 16h05-17h15

Locality: Line runs parallel to D854 road east of Büllsport.

Start S24.1564 E16.3647, End S24.1852 E16.3548

Total 3.3 km.

Habitat: Grass knee high, very dense. Many *Rhigozum* (driedoring) plants – low shrubs. Scattered patches of *Cataphractes*.

Results: No carcasses found. Tall grass and low afternoon sun makes detection v. difficult. I estimate that carcasses >5 m on either side of my path would have been missed.

Many Ludwig's & Kori Bustards observed in area by farm owner Ernst Sauber; but I saw only one Kori Bustard.



Top: The 33 kV HPCD private power line surveyed at Büllsport.

Bottom: General terrain in the area of the line - livestock farming on plains with the Naukluft Mountains in the background (*photos John Pallett*).

POWER LINE INCIDENTS

Three White-backed Vultures electrocuted at Aranos

A.C. van Zyl [A.C.Van.Zyl@nampower.com.na]

1/9/11: a vulture was electrocuted on the Vrede 33kV HLPD Retic. near Aranos. The pole appeared to be a roosting place.



6/12/11: a vulture was electrocuted on the Aminuis 33kV HLPD Retic. near Aranos (old carcass). There was a water point near the pole.



7/2/12: a vulture was electrocuted on the Leonardville 33kV HLPD Retic. near Aranos (carcass three months old). Drop-out fuses.



Brown Snake-eagle collision on Omburu – Gerus 220 kV and Earth Electrode lines

Jürgen Senke [jürgen.senke@nampower.com.na]

On 11/10/11 a Brown Snake-eagle (identified by John Mendelsohn) was found after it had collided with the Omburu – Gerus 220kV line, near the Gerus Substation (S20° 19' 21.2" E16° 27' 11.0"). Of note is that this line runs parallel to an Earth Electrode Line (steel monopole structure).



Spotted Eagle-Owl electrocuted on transformer at Aranos

A.C. van Zyl [A.C.Van.Zyl@nampower.com.na]

On 19/8/11 a Spotted Eagle-Owl was electrocuted on a transformer on the Leonardville 33kV Retic. on Farm Terra Nova. The incident first tripped the whole Leonardville Retic. and blew two fuses on the farm.



Secretarybird and Kori Bustard collisions north of Otjiwarongo

Peter Cunningham [pckkwrc@yahoo.co.uk]

9/11/11: I recently heard from a farmer approximately 30km north of Otjiwarongo (Farm Geluksput No 343) - Arthur Baggot-Smith - that he had observed a Secretary-bird and a Kori Bustard killed in power line collisions on his farm. He is willing to assist by monitoring lines on his farm.



Kori Bustard collision/electrocution on 33 kV line causes power failure at Gobabis

Darius Hangero [Darius.Hangero@nampower.com.na]

On 16/9/11 a Kori Bustard collided with a 33 HLPD kV line, in the Summerdown district, Gobabis, and was electrocuted, causing a power failure.



Red-crested Korhaan collision on Auas-Van Eck 220 kV line south of Windhoek

Nadia Hofnie [Reginadia.Hofnie@nampower.com]

On 13/12/11 the remains of a korhaan were found between pole no. 44 and 45 on the Auas-Van Eck 220kV line south of Windhoek. The remains were about one week old.

Ed: The identity of this (male) bird has been confirmed by John Pallet, Dr Dave Allan and Jessica Shaw, on account of the black belly, grey at the base of the foreneck and the distinctive chevron- markings on the feathers of the upper-parts. The collision site also fits in with the distribution of this species. This is the first record of a power line mortality for this species, which is near-endemic to

southern Africa. Interestingly, this korhaan has a spectacular display flight, in which the male flies up 10-30m, throws itself backwards and falls to the ground (as though shot), spreading its wings at the last moment. Korhaans are believed to have blind spots, similar to bustards (see page 8-9).

Wattled Crane collision on Gerus-Zambezi 350HVDC line in Caprivi East

Lise Hanssen [carnivores@iway.na]

In December 2011 I came across a Wattled Crane that appeared to have collided with the 350HVDC power line 20 km east of the Kwando River, at the Malombe Pan turnoff in the Kwando Core Area of Bwabwata National Park (S17 48.482 E23 10.949). The bird was running underneath the power carrier. It looked like both wings were broken as they were hanging on the ground.



The Wattled Crane is the largest and rarest crane in Africa; it is classified as Critically Endangered in Namibia, with only 300 birds (10 breeding pairs) and a global population of only about 8 000 birds. This pair was photographed at Lake Ziwey, Ethiopia (photo: Gunther Nowald, courtesy of ICF/EWT Partnership).

Genet electrocuted at Aranos

A.C. van Zyl [A.C.Van.Zyl@nampower.com.na]

On 7/12/11 a genet was electrocuted on the Pretorius 33kV HLPD Retic. near Aranos (old carcass).

