



BATS AND WIND ENERGY IN SOUTH AFRICA by Kate MacEwan

The growing concern regarding climate change and global warming and the finite amount of non-renewable energy sources has led South Africa to follow the global trend in selecting many sites for renewable energy development. By the beginning of 2013, the national Department of Environmental Affairs (DEA) had received 469 to 705 renewable energy Environmental Impact Assessment (EIA) applications, with 115 of these being validated applications for wind energy alone. Whilst most biologists would support the development of a 'cleaner', renewable energy source, such as wind energy in South Africa, the impacts that wind turbines may have on South African bats, and birds for that matter, could be very severe. Baerwald and Arnett (2013) calculated that up to 1 308 378 bats were killed in the USA and Canada over a 13 year period between the years 2000 and 2012. Even more alarming, is that Hayes (2013) and Smallwood (2013) estimate that the fatalities due to wind turbines in the USA in 2012 alone amounted to between 600 000 to 888 000 bat fatalities, respectively.

Why is this significant? Bats are among the most overlooked, yet economically important, non-domesticated animals, and their conservation is important for the integrity of ecosystems and in the best interest of both national and international economies (Boyles, 2011). The majority of bat species in South Africa are insectivorous and consume significant quantities of agricultural and health related pests. Insectivorous bats in the USA save farmers many millions of dollars in terms of reduced pesticide usage and reduced crop damage, with recent evidence pointing towards South African bats doing the same. Fruit and nectar eating bats play a vital role for many plants in terms of pollination and seed dispersal. There are more than 1200 species of bats in the world (over 20% of all mammals). Despite representing the second largest mammalian taxon, bats are largely neglected in their relevance for ecosystem function. They are long-lived, slow reproducing, highly mobile animals that fill numerous ecological roles and niches, making them excellent indicators of habitat disturbance and deserving of conservation.

In South Africa, there are about 56 species, compared with approximately 23 species in Europe; 17 in Canada and about 47 species in the USA. In order to integrate wind energy within South Africa in the least harmful manner, much research is needed – both pre-construction and post-construction research.

Given the limited knowledge of the ecology and biology of many bat species, and the absence of studies investigating the impact of wind farms on South African bat species and populations, it is strongly recommended that a proactive approach to mitigation is adopted, whereby fatalities are reduced from the onset of development. The cumulative impacts of mortality on affected species of bats could have devastating long-term population effects.

Certain bat family groups and species are at greater risk than others. High flying, open-air foraging bats, such as the free-tailed bats (family Molossidae) and migrating and clutter-edge foraging species from the families Miniopteridae and Vespertilionidae are most likely to be at the greatest risk of fatality because they fly within the rotor sweep zone. Gregarious cave-dwelling bats, such as the Natal long-fingered bat (*Miniopterus natalensis*) that migrates in potentially large groups are of particular concern in terms of mass fatalities. However, many other families, for instance, fruit-eating bats (family Pteropodidae) could be at risk. The Egyptian free-tailed bat (*Tadarida aegyptiaca*) and the Cape serotine bat (*Neoromicia capensis*), both insectivores, are species that have been found dead under South African turbines so far (NSS, unpublished; Aronson et al. 2013; Doty and Martin 2011).

The following positive steps towards bat conservation, in the context of wind energy, have put South Africa ahead of many other countries in the world – apart from the UK, Europe, the USA and Canada – where no such progress has been made:

- The Endangered Wildlife Trust (EWT), together with a couple of bat specialists compiled the first edition of the South African Best Practice Guidelines for Surveying Bats in Wind Farm Developments (Sowler and Stoffberg, 2011)
- These guidelines have been revised twice with input from contributing bat specialists, and with the latest third edition (a collaborative between the EWT and the South African Bat Assessment Advisory Panel (SABAAP)) having just been released in 2014.
- The South African Bat Assessment Advisory Panel (SABAAP) was formed in May 2013. SABAAP is an elected panel of bat specialists from private companies, academic institutions and non-governmental organizations, committed to providing advice on bat assessments, training and guidelines and to ensure the protection of South African bats. Wind energy is the current focus.
- The Council for Scientific and Industrial Research (CSIR) has been commissioned by the DEA to compile a Strategic Environmental Assessment (SEA) for renewable energy in South Africa. As such, the CSIR have commissioned various specialists to provide input into this process, including a bat specialist.
- Certain bat specialist companies have and are performing rigorous pre-construction bat monitoring surveys according to the best-practice guidelines, through acoustic monitoring of ultrasonic calls, transect monitoring, roost surveys and live capture and release.
- Some developers are working with bat specialists to implement optimal mitigation strategies.



However, despite the above positive steps, there are still many concerns, short-comings and knowledge gaps that need to be overcome. Examples of these include, but are not limited to, the following:

- Unqualified and/or inappropriately experienced natural scientists are labelling themselves as ‘bat specialists’ and are conducting specialist assessments.
- Certain bat specialists are not following the South African Best Practice Guidelines for Surveying Bats in Wind Farm Developments correctly.
- There is a growing concern that EIAs on bats in South Africa are often incomplete or inadequate and do not truly identify the impacts that a particular development will have on these unique animals; neither do they identify secondary effects on humans, due to the loss of ecosystem services offered by the bats.
- Adequate mitigation measures are not being recommended based on pre-construction monitoring, with many projects adopting a ‘wait and see’ approach. The problem with waiting for the operational phase to determine the mitigation measures needed is three fold:
 - Operational monitoring may not commence early enough. Many turbines in South Africa, despite not being connected to the grid, are spinning and potentially killing many birds and bats... and going undetected.
 - Valuable information obtained during pre-construction monitoring is not being used effectively and proactively.
 - Wind energy developers commit a certain financial output to their investors and a certain power contribution to the grid. If the impacts and proposed mitigation measures are not understood from the commencement of operation, should there be large-scale fatalities and mitigation is required, this will have production, financial and legal implications that were not accounted for from the start. Meaning delays in or never implementing mitigation.
- Some developers are not prepared to implement the mitigation measures recommended by specialists.
- Many of the projects awarded in round one of the Renewable Energy Independent Power Producer Programme (REIPP) were not bound by conditions for pre- or post-construction monitoring, and convincing them to implement such programmes may be more challenging.
- As South African bat specialists and scientists, we don’t yet have a handle on bat population numbers and key movement patterns across the country, in order to fully determine the significance of bat fatalities due to wind turbines and to set thresholds of fatality below which populations will not be severely impacted.

As Cryan (2011) wisely writes: “The story of bats and wind turbines highlights the importance of proactive measures to ensure the health and well-being of vulnerable wildlife populations before or soon after unexpected threats arise and quickly take their toll. Understanding and anticipating such problems depends on a combination of scientific research and a mandate for vigilance.”



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Bat News

By Julio Balona

Interesting new research

Mysteries of frog hunting

You may recall from our last bat news update that the Fringe-lipped bat was found to locate its frog prey by the betraying presence of ripples resulting from their calls, even if they stopped calling.

Now further research is suggesting that the inflated vocal sac of the frog is also used as a hunting cue – if an artificial ‘robofrog’ called without an inflated vocal sac, it was less likely to be found.

I have not read the research papers but it seems to me that the two studies, when considered together, show that frog hunting by Fringe-lipped bats is less simple than when either study is considered alone. It appears that the bat uses multiple identifiers. That is, I’m guessing it homes in on a general location of the frog by its calls, and then a specific location by the acoustic signature of the vocal sac. And if the frog stops calling it can nevertheless still give its location away from residual ripples.

Previous study on effect of ripples:

<http://www.utexas.edu/news/2014/01/23/tungara-frog-research/>

More recent study on vocal sac recognition:

<http://www.digitaljournal.com/science/bats-use-echolocation-to-hunt-for-tungara-frogs/article/401042>



A Fringe-lipped bat (*Trachops cirrhosus*) with an atypical dinner (Photo: Lars Heiden/ STRI)

Bats taught that there is something fishy about heavy metal music

In another story relating to Fringe-lipped bats (they seem to make a good study subject), a researcher was able to train them to associate food with heavy metal music. This was done in a flight cage by playing the mating call of the tungara frog, their favourite prey, which attracted the bat’s attention. Although the bat was expecting a juicy frog, it was instead rewarded with a piece of fish placed on the loudspeaker. This is equally edible to the bat and easier to provision than frogs.

Each time the mating call was faded into an increasing portion of a specific heavy metal song until by the end of the night, only the song was playing.

The point of the whole exercise was to enable the bats to be summoned in the forest after being released. By playing the song they would quickly arrive where their calls could be recorded. Their echolocation calls could then be compared with those recorded when the bats were in the flight cage. The ultimate aim is to establish the flexibility of this bat’s echolocation with respect to its environment.

<http://smithsonianscience.org/2014/10/scientist-uses-heavy-metal-music-train-wild-bats-panama/>

Chairman's Report 2013 to 2014



GNoR BIG is now twenty years old¹!

Last year I incorrectly reported that we were eighteen, the result of using the previous year's report as a template and forgetting to update the year. This time around, the discrepancy between the year of our birth, 1994, and the current year, was obvious without significant mental arithmetic and I then realised the error I had made.

Apologies for the mistake, although it appears that no one noticed...

So we are as old as the New South Africa. Fortunately the group's development has been less controversial in comparison and its management more reliable.

The year reviewed

We started the year with a bat walk at the **Johannesburg Zoo** in August. This is becoming one of our regular venues and we had about 65 people which is a decent turnout.

In September it is still a bit cold for a conventional outing with nocturnal trapping so we instead did a day trip to the **old mine tunnels at Venterskroon**, just outside Parys. This is an easy way to see fair numbers of three species of bats only about an hour and a half from Johannesburg. Such an outing is also useful for informal monitoring of the colony which appears to still be in good health.



VENTERSKROON



The following month we ran a bat walk at **Kloofendal Nature Reserve**, one of our favourite venues for this type of event. With a mediocre turnout of 36 people this was surprising – we usually have no problem getting an audience of 60 to 80.

www.batsgauteng.org.za

¹ Including the initial period when we were still the Gauteng Bat Interest Group (GBIG).

In November we did a long weekend trip to two areas with a lot of potential next to the Swaziland border, the **Mahushe Shongwe Nature Reserve**, and the **Masibekela Dam** which is known for water birds. We were asked by the Mpumalanga conservation authority to survey the dam area in particular, because, as with so many sites these days, it is threatened by mining. Also, neither of these places had been surveyed for bats before.

It was quite an enjoyable outing and we found a variety of other interesting creatures as well.



In December we visited another area that has seen little bat work, the **Molemane Eye Nature Reserve** and a cave nearby, both outside the town of Ottoshoop in the North West Province.

Although we did not find a great variety of bats, the work is important since it helps fill in the many gaps we have in our distribution maps.



The surveys we have done here and at other sites in North West is through a good relationship we have with their conservation authority, and our data has been included in their recent major project to inventory the province's biodiversity. In this regard I was pleased to receive a letter from their Head of Department Mr. T. Nell, addressed to GNoR BIG which reads:

It is with great pleasure to announce that the North West Biodiversity Inventory Project has been successfully completed and the Department wishes to make use of this opportunity to sincerely thank all those who assisted in this endeavour.

The information obtained from the plant, mammal and bird inventories can now bolster bioregional planning initiatives in the province and hopefully ensure for more informed planning and decision making around issues of biodiversity conservation in future.

We would like to thank you for agreeing to work with our biologist Mr. John Power, and surveying bats in our province - to my knowledge - on at least three different occasions.

Bat catching protocols are highly specialised and such skills are hard to come by, so we thank you making the effort to engage with us on this, and we are aware that you volunteer your own time for this.

The information you have been able to facilitate for us will be useful for us in being able to formulate conservation policies for bats in the context of broader biodiversity sector plans.

We hope to be able to continue our good working relationship with similar projects in future.

I am happy to get this sort of feedback since it affirms a direct contribution by GNoR BIG to bat conservation.

By the way, we also still have effective and mutually beneficial rapport with the authorities in the other provinces we work in, i.e. Limpopo, Mpumalanga, Gauteng and the Free State.

It goes without saying that this is critical to the success of our field trips.

In January we gave a talk to about 30 people from the Johannesburg South Garden Club which is a good turnout for this type of audience.

In the same month, we did an outing to yet another site that has not been surveyed and is threatened by mining: **Yzermyn Farm**. This is an old coal mining area in Mpumalanga, between Piet Retief and Wakkerstroom. Here, fair sized colonies of at least three species of bats have made their home in the abandoned mine tunnels where the walls are literally made of coal. Unfortunately the intention is to re-mine this site.

We found nothing rare on this trip, but there was a nice variety of species including some non-cave-dwellers, and once again it helps to fill in the gaps in the distribution maps.



In March, we did another talk with a mediocre turnout (23 people) at the **Meiersdal EcoEstate** in Johannesburg south. We were however also able to fit in two nights of trapping in which we caught a Yellow house bat on both evenings which are still scarce in this area. Also, it was the first time I've seen a hedgehog after one was bought in that had been found on the estate.



The same month our bat walk at our most popular venue, the **Pretoria Botanical Gardens**, only had a turnout of 75 people. While this is a decent sized audience for a bat walk, it is about half of what we normally attract at the gardens.

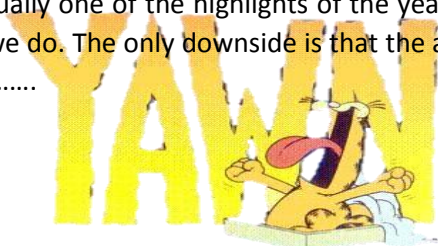
In April another bat walk was held at the **Johannesburg Zoo**, this time with quite a poor attendance (18 people). In this case the organization on the Zoo's side was in a bit of disarray and the event was not advertised effectively.

May and June are too cold for outings and there were no other events.

Finally, in July we held our AGM. I normally include this on our list of activities for the year but while I was preparing my Chairman's address I questioned whether this was really appropriate. I mean, what organization considers its AGM as significant as many of its main activities?

I then reassured myself that this is an event that deserves a place on the list because our AGMs are more than an administrative meeting. Afterwards we always have a speaker that is very knowledgeable and worth listening to. This is followed by a very social consumption of fabulous soup and bread made by our Treasurer Sharron.

So the AGM is actually one of the highlights of the year and I doubt many organizations actually look forward to theirs in the way we do. The only downside is that the attendants have to listen my speech before they can get to the pleasantries.....



Activities for 2013/2014



| | | |
|--------|---|---|
| Aug 13 | : | Bat Walk JHB Zoo (65) |
| Sep 13 | : | Venterskroon Mine Tunnels Outing |
| Oct 13 | : | Bat Walk Kloofendal Nature Reserve (36) |
| Nov 13 | : | Masibekela Dam / Mahushe Shongwe N. R. Outing |
| Dec 13 | : | Molemane Eye N.R. Outing / Ottoshoop Cave Outing |
| Jan 14 | : | Talk JHB South Garden Club (30) Yzermyn Farm Outing |
| Feb 14 | : | - |
| Mar 14 | : | Talk Meyersdal Eco Estate (23) + Survey Bat Walk Pretoria Botanical Gardens (75) |
| Apr 14 | : | Bat Walk JHB Zoo (18) |
| May 14 | : | - |
| Jun 14 | : | - |
| Jul 14 | : | AGM (+ Quality Talk Hosting + Social) |

So overall, I'm happy with what we have achieved this year and that we have been quite active with an event held every month on average.

The review above is mostly qualitative and since it is my tendency to try to assess performance quantitatively for clarity, I have put some numbers to our events so that we can gauge how we have done, compared to previous years:

| 2009/2010 | | 2010/2011 | | 2011/2012 | | 2012/2013 | | 2013/2014 | |
|----------------|------------|-------------|------------|-------------|------------|-------------|------------|-------------|------------|
| 5 Talks | 100 | 8 Talks | 200 | 5 Talks | 145 | 4 Talks | 90 | 2 Talks | 53 |
| 4 Bat Walks | 275 | 4 Bat Walks | 210 | 4 Bat Walks | 185 | 3 Bat Walks | 310 | 4 Bat Walks | 194 |
| 4 Outings | | 6 Outings | | 5 Outings | | 5 Outings | | 4 Outings | |
| 1 Bat Workshop | 25 | | | | | | | | |
| | <u>400</u> | | <u>410</u> | | <u>330</u> | | <u>400</u> | | <u>247</u> |

(The numbers on the right of each event is an estimate of how many people were in the audience.)

With respect to talks, it seems fair to expect about four or five talks annually. We did not do very well here.

(We ignore the 2010/2011 year which was atypically and unsustainably productive.)

For bat walks, four appears to be the going rate and is what we managed.

Summing up the number of people educated, we were frankly rather on the low side this year. However, I must just caution that more is not always better. For talks, we would like crowds as large as possible as long as they can hear us and see our slide show. But for bat walks there is an optimum audience size (usually about 70-80 works well), otherwise it is hard to manage the group and the exercise becomes less effective.

Apart from education and outings, as usual we have also responded to numerous queries from the public and provided bat advice, in addition to publishing two newsletters. Once again we fell short of our target of quarterly issues, but they have maintained a good quality and were richly informative. They were also put together and embellished in an impressive manner by our Newsletter Editor Trevor Morgan.

Membership has hovered around 50 which is where it has been for the last few years.

In terms of challenges we have faced this year, one that has arisen is the unsatisfactory attendance to bat walks and talks. I am certain that in some cases this was due to factors beyond our control, but in general there has been a trend towards smaller audiences. The reasons for this are not clear but in future we will have to keep this in mind and be more proactive about our advertising.

Another challenge that I have come to see as my pet frustration, is the poor extent of the sharing of our knowledge and data with those who can use it for conservation.

This has improved notably. An example is the thank-you letter from the North West conservation authority we received.

Also, last year I indicated that I was about to submit a paper to an academic journal on our findings regarding the critically endangered *Cloeotis percivali* and indeed I did. But it was rejected and in retrospect the particular journal was not really suited to this sort of information.

Fortuitously, however, a few months later the Endangered Wildlife Trust kicked off the project to revise the Red Data List for southern African mammals which was long overdue. We were asked to contribute to the project and the write up I had put together was pretty much what was required for re-assessing *C. percivali* and the primary intention of publishing this information in the first place. In addition to this, GNoR BIG supplied in excess of 300 bat records to the project. Lastly, we sponsored the assessment of the Rusty Bat.

So in summary, this has not been our best year, when we compared ourselves with ourselves. When compared to a typical voluntary group working in their spare time, we have been very productive and active.

In my opinion it does not help to pursue quotas too intently in the quest for continuous improvement with a volunteer group. The participation and commitment of the committee and members only lasts as long as they are enjoying it, and if that means that performance may vary, then so be it – as long as a good overall standard is maintained.

Future

A quick review of the year to come:

We hope to arrange our first outing to the Eastern Cape this September. I must say though that this may not pan out as it is already becoming clear that the roads are bad in this area and few members have a 4x4 or even a bakkie. So we may have to postpone any foray into this part of the world until the logistics can be improved.

In October we will hold our first ever joint outing with our sister group Bats KZN. This will be to the Paulpietersburg/Vryheid area.

And in November another pioneering visit, this time to the famous Groot Marico district in North West Province.

For the rest of the year our destinations will still be confirmed.

Three bat walks are planned for our usual venues, the JHB Zoo, Kloofendal and the Pretoria Botanical Gardens. A fourth will be run at a different location for a change, either at Walter Sisulu Botanical Gardens or at Delta Park. This may help us tap into a new audience.

People

Lastly, but not leastly, we must recognize the reason why GNoR BIG continues to be so successful is our Executive Committee which steers and drives the group. Since we are a collective that tries to spread the word and convert people from bat-phobes to bat-philes, you could call the committee The Ten Disciples of GNoR BIG. And once again I am happy to be able to use the same slide as last year, which is not much different from previous years, since there have been no change. This bears testament to the stability and cooperative functioning of the team.



Other people who must be thanked for their worthy contributions:

Mimi Neumann for the crucially important work of maintaining and managing our invaluable website free of charge.

Representatives of the various nature conservation departments - Lihle Dimalisile (Gauteng), Stan Rodgers (Limpopo), John Power (North West) and especially Lientjie Cohen (Mpumalanga) – all of whom facilitate the crucial necessity of obtaining batting permits, and assist in other ways.

Staff at Pretoria Botanical Gardens and Johannesburg Zoo.

Karin & Steve Spottiswoode and the Friends of Kloofendal.

The bat scientists, namely Peter Taylor, Ara Monadjem and Teresa Kearney, for their continued support, feedback and exchange of information.

Also, Prof. David Jacobs for his willingness to give a very interesting talk at our AGM.

The non-committee GNoR BIG members that are so helpful and enthusiastic: the Barkhuizens and the Goffinets.

A special vote of appreciation to Brian Whiting for once again allowing us to use Winchester Marketing as an excellent AGM venue.

Finally, thank you to the paying members of GNoR BIG themselves without which our great group would not exist.

Julio Balona, Aug 2014

More Bat News

Progress in the use of bacteria to fight WNS

Previously we reported that bacteria were being researched as agents to fight White Nose Syndrome. Now in Missouri a bacterium has been identified as a possible contender and in the coming winter it will be tested in a cave for the first time. The idea is that if many of the bats can be swabbed it may help them survive and allow evolution of resistance in the population.

<http://www.columbiamissourian.com/a/179719/as-deadly-bat-disease-spreads-columbia-researcher-offers-hopeful-answer/>

Consequence of WNS: the rise of the Big Brown Bat

Up until the advent of WNS, the Little Brown Bat (*Myotis lucifugus*) was the most common species in New Jersey State (and probably much of the US). However, due to the disease populations have plummeted so much that it is nearly extinct there. Conversely, numbers of the Big Brown bat (*Eptesicus fuscus*) have actually increased and in some cases they have moved into Little Brown bat roost sites. It is believed that Big Browns are much less susceptible to the disease due to differences in size and hibernation habits.



This interesting turn of events leads me to wonder if this type of phenomena can sometimes lead to long term variations in species distributions, ones that biologists often struggle to explain from the traditional reference points such as habitat or niche.

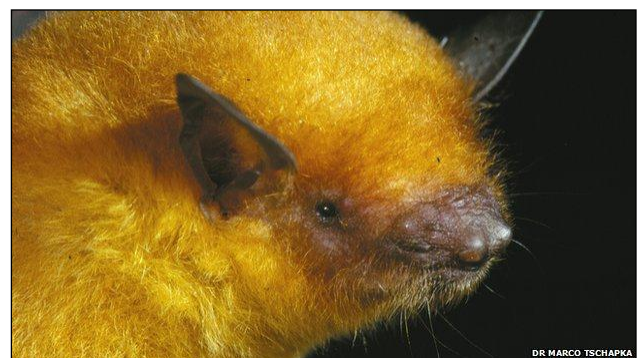
<http://www.northjersey.com/news/big-brown-bats-in-n-j-thrive-as-smaller-cousins-decline-1.1113598>

New beast from Bolivia

A new species of *Myotis* has been identified after examination of a collection of museum specimens originating from the Bolivian savannah. Although this is not such an unusual event in the bat world, especially with the advent of DNA methods and bat detectors, I thought it worth mentioning because it is a rather attractive little beast:

Introducing the Golden bat (*Myotis midastactus*).

Apparently, capturing living specimens has so far not been successful. But I'm struck by the attached photo – it looks rather alive, not like a typically violated museum specimen..?



<http://www.bbc.co.uk/nature/28583377>

Spotted beauty from Canada

And in the same vein as the above story, a new colony of the Spotted Bat of North America was recently found on Vancouver Island in Canada. A rare species in the region, it is also noteworthy because it is such beautiful animal and I had to share...

Looking at this bat, I somehow wouldn't imagine that it is a high flier, its anatomy (i.e. large ears) is more typical of a clutter feeder or gleaner. But it turns out mistnets 12.5m high by 18m wide were required to capture them.



And I reprimand myself for forgetting that temperate regions are not without their interesting and sometimes striking bats.

<http://www.vancouver.sun.com/technology/Researchers+rare+Spotted+bats+near+Lillooet/10688913/story.html>



Photographs: Jared Hobbs



The quiz to test your skills on the identification of southern African bats.

The rules are:

- The mystery bat will be from the southern African region as defined by the countries South Africa, Swaziland, Lesotho, Mozambique, Zimbabwe and Namibia.
- It will not be a species that is a rare vagrant to the region (e.g. Bergman's collared fruit bat, *Myonycteris relicta*), although it could be one that is relatively scarce (e.g. Rüppell's pipistrelle, *Pipistrellus rueppellii*).
- There may or may not be supplemental information provided (e.g. frequency of bat call, geographical location, forearm size, etc.)

Identification of mystery bat No. 6

Careful inspection will reveal an important detail → In addition to the claw on the thumb, there is a second one on the first finger.

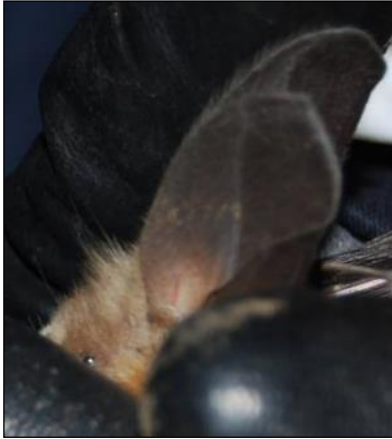


This will tell you that the bat is one of our large fruit eaters. Apart from a few rare species, all the frugivorous species in southern Africa have white tufts at the base of the ears except two:

The Straw-coloured fruit bat (*Eidolon helvum*) is named for its yellowish-orange neck fur which is not apparent in our bat. Elsewhere the fur also appears to be the wrong colour, a grey-brown rather than orange-brown. This leaves the only other option, the Egyptian fruit bat (*Rousettus aegyptiacus*).

Mystery bat No. 7

Can you deduce the name of the beast below?



Ear length = 31.8 mm

Forearm length = 46.3 mm

Close up of upper incisors

GNoR BIG Treasurers report for the year 2013/2014

Cash on hand as at 30th June 2014:

Current account R 2,504.68

Investec Bank R 20,057.67

Call account R 1,015.88

Total income for the year was R18,638.24 against expenses of R17,665.19

The club generated a net income for the year of R973.05 vs a profit last year of R1,330.98.

Member subs were up on the previous year and as at 30th June we had collected R290.00 subs for the 2014 / 2015 subscription year.

The income from bat walks and merchandise sales generated was on a par with last year.

Once again thanks to the whole committed for their dedication and hard work to achieve this, your effort as always is greatly appreciate.

Last year I incorrectly stated that there was no income from bat talks – my apology to Erna and Julio who are always willing to take on the responsibility of doing these talks – Last year's income was R450.00 against this year's income of R570.00

Thanks to Trevor, Julio and Erna for the fantastic newsletters and to Erna for the work done on keeping our members updated and ensuring membership fees are received timeously.

Julio your dedication to arranging and running the bat outings is always appreciated.

New equipment purchased this year was Bat Detector amounting to R 13, 847.00 which was badly needed.

Without our website we would not be able to offer our members or the public the service we do so from me a huge thank you once again to Mimi.

Sharron Reynolds, Treasurer

Jammin'



Mexican free-tailed bats are very much a social animals and can live in colonies numbering millions. This gathering has benefits such as the lower likelihood of an individual falling prey to a hawk when the bats emerge *en masse* from their cave. However, it surely has implications for competition if one considers the sheer density of an airborne colony of foraging bats converging on the same prey items. In this regard, researchers have found evidence that suggest that Mexican free-tails can jam each other's echolocation: They saw that the bats almost always missed their prey when another bat was emitting specialized jamming calls. Furthermore, the bats were

often found to counter jam each other until one of them gave up.

<http://phys.org/news/2014-11-hungry-prey-sonar.html>

Sexy sopranos

It is quite feasible that echolocation may serve purposes additional to navigation and prey targeting. Studies have indicated that conspecifics are able to recognize each other by these calls*, which would not be too surprising considering how easily humans are able to identify each other by voice alone.

A recently published study on a colony of horseshoe bats (*Rhinolophus mehelyi*) in Bulgaria provides evidence that it may be a basis for sexual selection. Female bats were found to show much more attention when male higher frequency echolocation calls were played to them than with male lower frequency calls. There could be several explanations for this so the researchers also examined other factors and found that higher frequency calling males were larger and heavier, and that these were fathering more young according to DNA analyses from the colony.

If call frequency is indeed driving sexual selection it is interesting since as frequency increases the sound waves cannot travel as far, reducing prey detection distance. The researchers have indicated that this is indicative of the sometimes opposing forces of sexual and natural selection. They're probably right but I ponder another possibility: higher frequency calls also allow greater resolution of the 'sonic image', which would enable the bats that emit them to detect smaller prey. Therefore if where this colony forages small moths or flies are abundant, and larger invertebrates are rare, higher frequency calls would benefit, soprano bats would be bigger, and the chicks would dig them. And there would be no conflict between sexual and natural selection.

So I'd be really interested in a dietary analysis of these bats...

<http://www.siliconrepublic.com/innovation/item/37836-wit2014/>

<http://blogs.discovermagazine.com/inkfish/2014/08/26/for-these-bats-the-best-falsetto-wins-over-the-ladies/>

* Check out this study on the Lesser Bulldog bat: <http://smithsonianscience.org/2010/06/echolocation-calls-of-bats/>

Schizophonic desert bats

In Africa we have slit-faced bats (*Nycteris spp.*) which have such soft echolocation calls that they can only be picked up about a metre or two away with a detector. For this reason they are known as whispering bats.

Now imagine if a slit-faced bat suddenly started shouting instead. ..

This behaviour has apparently been recorded in another whispering species, the Desert long-eared bat (*Otonycteris hemprichii*), in Israel. From barely audible echolocation, the bats changed to loud calls more typical of open air feeders like free-tails. It appears that they switched from their normal foraging method of capturing invertebrates from the ground, to hunting insects in the air where louder calls become necessary, presumably due to the lower density of prey and greater detection distance required. And it is believed that this response was due to a shortage of their usual prey.

<http://phys.org/news/2014-09-strategy-food-scarce.html>

New form of echolocation

For some time it has been understood that amongst the Old World fruit bats, only the Rousettus family possessed the ability to echolocate, but using tongue clicks rather than their vocal chords.

Now scientists have made a surprise discovery: at least two other fruit bat species from South East Asia were found to use clicks made with their wings to navigate.

Although not as accurate as that of a typical insectivorous species, this form of echolocation is still undoubtedly an asset, especially combined with vision adapted to low light conditions.

It's always been impressive to me how well our fruit bats find their way in the dark using sight alone. Now I wonder if any of them may be using other techniques that we are not aware of...

<http://news.nationalgeographic.com/news/2014/12/141204-bat-echolocation-sonar-wing-animals-science/>

Other stuff

Migration mistnet

Netting bats has been taken to an impressive scale in Latvia. In August last year, a set of large mistnets were erected in anticipation of a flux of migrating bats which are funnelled through a certain area near the Baltic Sea by geographical features.

So far I have not seen any reports of how successful this endeavour was.



http://www.upi.com/Science_News/2014/08/18/Latvia-boasts-worlds-first-net-for-migrating-bats/3861408398288/

Bacardi

The bat logo of Bacardi rum is well known, but its origin less so. It turns out, and is therefore worth pointing out for bat fiends, that it is a genuine bat friendly brand. The story is that more than 150 years ago a family of bats were living in the company's first distillery in Cuba. Happily, rather than killing or evicting them as would happen in so many parts of the world, they were instead chosen as the company emblem. In fact, they were considered as bringing good fortune and symbolizing family unity.

Coincidentally, close to Bacardi's US headquarters in Coral Gables in Florida, is one of the world's few known roosts of the rare Florida Bonnet bat (*Eumops floridanus*).



<http://www.11alive.com/story/life/2014/09/09/rare-bat-colony-getting-cheers/15321913/>

**NaNaNaNaNaNa
NaNaNaNaNaNa**



Batfan!!

NEW MEMBERS

A **BIG BATTY** welcome to the following new members:

Animalia with new company membership. **BIG** welcome to **Werner Marais** and **Monika Moir**.

Caroline Lötter is a zoologist working with bats that is keen on learning more about bats.

Gilium Wolfaard has always been fascinated by bats, learned about GNoR BIG on Facebook and decided to join.

Monique Shanahan is also interested in bats and decided to join GNoR BIG.

From University of Pretoria virology department:

Andre Coetzer has a general interest in bats and decided to join the Bat interest group.

Celeste Schepers is widely enthusiastic about bats.

Marinda Mortlock joined because it has been made mandatory for bat handling at university of Pretoria.













Marieke Geldenhuys also join because of it being a mandatory requirement for bat handling at Tukkies.

Jessica Coerzer is a postgrad student involved with bat handling and sampling of bats

GN^{BAT}RBIG Committee

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|---|--|
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Merchandise

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|  <p>Baseball caps R60 each</p> |   <p>'Bats' T-shirt with 'Bat Food' on back Black or Navy Blue R90</p> |
|    <p>Various 'Bat' T-shirts R80</p> | |
|  <p>Sticker R8</p> |  <p>Bat jewelry R20</p> |
| |  <p>Echoes of the night CD R50</p> |
|  <p>'Be kind to bats', Kids T-shirt Black or Navy R55</p> |  <p>'Fruit Bat' T-shirt R75</p> |
| |  <p>'Gentle Friends' T-shirt Blue or Green R65</p> |