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The Amur Kestrels of Ventersdorp

Henk Bouwman

The Amur Kestrel (*Falco amurensis*) has its breeding range in China, Mongolia, Siberia and North Korea (the Amur River is the border between China and North Korea), and migrates to southern Africa during their winters. The length of one migration flight is about 11 000 km, and takes them from India, across the Indian Ocean to East Africa, and then south to Zimbabwe and South Africa. This is the longest uninterrupted over-water migration flight (3000 km) for any raptor. Their return journey is not the same, but amazingly, we have no idea where they go to after they reach Kenya. They may go north of the Himalayas, but this is still speculation. The birds weigh in between 97 – 188 g (about the same as a normal cell phone), amazingly light for a bird that can fly so far. They start arriving in SA in November, and begin returning in March.

While they are territorial on their breeding grounds, they are gregarious when over here. During the day they spread out over farming areas and grasslands, where they can be seen perched on telephone wires, catching goggas on the ground, or hawking them in flight. They particularly like termite outbreaks, and can be seen circling clouds of flying termites at dusk. We have counted them catching and eating termites



in flight, at a rate of one every 3.3 seconds! Looking into setting sunlight, a cloud of termite wings tumbling to ground can be seen.

Over a period of an hour, 5500 Kestrels can consume almost 6 million termites (222 kg)! Imagine the advantage it brings to local farmers. Over the period when they stay in SA, this roost could consume 240 000 000 insects, or about 21 000 kg of insects!

The real reason for writing this is the spectacle at the roosts, when they return at night. It is a sight to behold. Together with the BirdLife Wesvaal Bird Club, we help conduct regular counts at the Ventersdorp blue gum tree on the road to Derby (you will recognise it). The birds start arriving from 16:00 but the real flood opens from 18:00 with a peak just before dark. My old eyes can't keep up, but the students assure me that the peak rate of arrival is close to a 100 birds every 10 seconds – and I believe them!

Depending on weather conditions and disturbances, you sometimes see between 5000 and 10 000 birds circling the tree, all at once! Your mouth just hangs open – it is truly one of nature's spectacles, and it is just on our doorstep. Venterdorp does not get all the best press coverage, but you can do yourself a favour to drive out for the evening, gawk up at the birds and have a drink and eat in the town afterwards.

This will enhance the value of the birds to the town, and the town will then look after these visitors from another continent and an ocean away! To add even more value to your experience, with an estimated 50 000 individuals of this species in the world, you can see 5–10% of all existing Amur Falcons in one go.

For more info on these birds go to <http://www.kestreling.com/>. There are counters needed at other roost sites in SA, such as at Boshoff, Bothaville, Cradock, Dealesville, Koppies, Reddersburg, Allanridge, Ritchie, Marquard, Memel, and Warden.



Female Amur Falcon

Africa "Ozone"-wonderful

Pieter Smit

The Plant Physiology Research Group of the School of Environmental Sciences and Development form part of the Air Pollution Information Network Africa's (APINA) taskteam, since 2004 on the effect of air pollution on crops. In September 2005 an ozone biomonitoring pilot study was conducted at the Potchefstroom Campus of the NWU. In this experiment two biotypes of white clover (*Trifolium repens* cv. Regal), one ozone sensitive (NCS) and one ozone resistant (NCR) biotype, were exposed to ambient conditions. The effect of the ambient ozone on the plants were assessed by visual injury and the difference in biomass yield. After the successful completion of the pilot study an international ozone biomonitoring workshop was held at the NWU, Potchefstroom Campus, to train and inform other southern African participants of APINA to perform the same experiment in their own countries. The participating countries include Tanzania, Mozambique, Botswana, Zambia and Zimbabwe.



Ozone sensitive and ozone resistant biotypes of white clover at the experimental site at Potchefstroom campus, NWU

After a few failed attempts to mitigate plants at the sites in the other southern-African countries, APINA decided that a representative from the air pollution impact study group of the NWU must be sent to each of these countries, supplying them with the clover cuttings and assist them to get their experiments started.

I was fortunate to be the one chosen to visit Tanzania, Mozambique, Botswana and Zimbabwe, and to help them to set up the experiment.

My first trip took me to the small university town of Morogoro, about 100km South-West of Dar-es-Salaam. It took almost 3 hours on an overcrowded bus on a small road to get from Dar-es-Salaam to the friendly town. The participants, Prof Salim Mlondolo and Dr Abel Kaaya, are both scientists and lecturers at the Sokoine University of Agriculture, a big university on the foot hills of the Morogoro Mountains.

I was fortunate enough to visit some farmers deep in the Morogoro Mountains. I accompanied one of the lectures showing farmers how to put up their bee hives. In the mountains the farmers exploit the rich soil and there is plenty of water to grow crops, especially vegetables. The currency in the mountains are bananas they are used to trade. A banana has a value of about 50 RSA cents. Unfortunately it became known after my visit that their experiment failed again. At this stage it is most unlikely that it will be tried again.

Participants of the Ozone Biomonitoring Workshop held at Potchefstroom.

Participants include, representatives of the different countries, the director of APINA, Prof Håkan Pleijel Göteborg University Sweden, Prof Madhoolika Agrawal India and Dr Patrick Buker from the Stockholm Environmental Institute, York University, UK



With just enough time to get clean clothes and get new batch of cuttings, I was off again to

Maputo, Mozambique to meet Dr Esmeralda Arone, director of the Meteorological Department of Mozambique and task-team representative. The Fortunaly experiment is doing very well in Mozambique, as the experimental team is very well equipped and the infrastructure is top class. The experimental site at Umviluze 40 km west from Maputo is very well situated.

My next journey was to the Harry Oppenheimer Okovango Research Institute near Maun in Botswana to meet Dr Wellington Masamba. This is one of the experimental sites with naturally high tropospheric ozone levels and thus ideally situated for carrying out a ozone biomonitoring experiment. Unfortunately this institute did not have all the basic infrastructure needed for the experiment. We had to build a make-shift green house for propagating the clover plants.



The view of the Morogoro Mountains from the biomonitoring experimental site in Tanzania

work and determination the participants under guidance of Ms Eunice Mogosho are really busy making a great success of the experiment.

I want to thank APINA, the North-West University and especially, Prof Gert Krüger for the once in a lifetime experience.

My last trip took me to the capital of Zimbabwe. The secretariat of APINA is situated at the Institute of Environmental Science (IES) at the Harare University. The experimental site is situated about 30 km outside Harare at the Henderson Agricultural station. Although the site doesn't have the best infrastructure, with hard



The make-shift greenhouse we built outside the office building at the Harry Oppenheimer Okovango Research Institute.

From the AP Goossens Herbarium: Trees of the Potch Campus

Stefan J. Siebert, Sarel S. Cilliers & Madeleen Scrúwig

*It is difficult to realize how great a part of all that is cheerful and delightful
in the recollections of our own life is associated with trees ~ Wilson Flagg*

Across the world most university grounds have vast groves of trees and shrubs for ornamentation purposes and to soften the unnatural effect generated by concrete and brick. Over the years these plantings have grown into notable collections (arboretums) and many are now regarded as of educational value. The North-West University (NWU) is no exception and has for decades made use of the trees and shrubs on campus to educate undergraduate students in various aspects of biological sciences. The need was so widely recognised that a campus tree route was developed in 1998 by one of us (SSC). Thereafter the AP Goossens Herbarium was tasked to maintain and further develop this route to include the majority of tree species on campus.

The first step in the development of the new tree route on campus required the herbarium staff to compile a complete species list (and localities) of all the trees, shrubs and climbers growing on the campus grounds. This survey excluded the NWU Botanical Garden to avoid duplication, as a separate survey is in progress under the auspices of the garden curator. This led to many enjoyable walks on campus and subsequently a herbarium specimen was made of every woody species on campus with a height above 1.5 m. These voucher specimens are kept in a concession cabinet in the AP Goossens Herbarium and is open for use to anyone with an interest in trees.

During the survey the participating staff estimated that there should approximately be 80 tree species on campus. Surprisingly, we found 105 tree species of which three are declared protected trees according to National Forests Act (no 84 of 1998), namely *Podocarpus elongatus*, *P. falcatus* and *P. henkelii*. The total number of woody species (trees, shrubs and climbers) on campus numbered 178 species in 65 plant families. Five plant families account for 35% of the woody plants on campus, namely the Rosaceae (Rose family), Fabaceae (Pea family), Anacardiaceae (Mango Family), Caprifoliaceae (Honeysuckle family), and Myrtaceae (Guava family). Few people are aware of this rich specific and ultraspecific plant diversity when they admire the green lushness of our beautiful campus.

Statistics always make for interesting reading, but can spark some shocking realisations! For instance, the cultivated indigenous species on campus number only 40, while 138 alien species are grown. This is indeed unfortunate as Potchefstroom lies in the country with the richest indigenous temperate flora in the world. One could argue that the grasslands around Potchefstroom have always been devoid of suitable woody species that could be cultivated in this harsh climate. However, considering the favourable microclimate on campus and the treasure trove of indigenous woody species grown in the NWU Botanical Garden, one cannot comprehend the current numbers of exotics on campus. Even worse is that 38 of the woody species on campus are declared alien invasive plant species by law (Conservation of Agricultural Resources Act (no 43 of 1983)).

Once the tree route has been laid out, we hope to introduce name boards, similar to what is currently being employed in the NWU Botanical Garden. The name boards will include the common and scientific names as well as interesting facts of the species. The first step, however, will be to place some name boards in specific areas to test their ability to

withstand student 'curiosity'! In addition to the name boards, a booklet will be produced that will contain detailed information on every specie and to guide visitors along the route. Further activities will include the merging of the campus list with the list of the NWU Botanical Garden and at a later stage to merge the NWU list with the list compiled for Potchefstroom by the Dendrological Society. At that point it would probably be useful to publish an educational photographic guide of the trees, shrubs and climbers of the Tlokwe Municipal area. Other non-scientific projects currently running is the 'Campus Big Tree Project', aimed at identifying the 'Big Five' trees on campus, by applying a formula used by the Dendrological Society to update the Big Tree Register of South Africa.

*And remember this old, but applicable, Chinese adage:
Keep a green tree in your heart and perhaps a singing bird will come.*

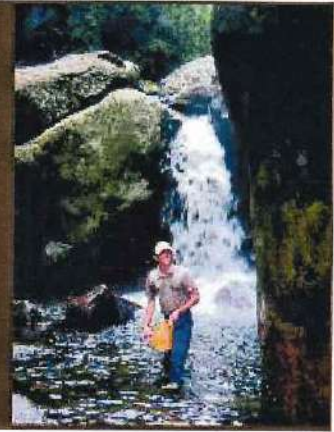
Anyone is welcome to add trees, shrubs and climbers to the checklist (available on the Botany Website), as long as the respondent can provide us with the plant's locality on the Potch Campus. For more information or assistance, contact the herbarium curator at x2507 or the herbarium assistant at x2505





Amfibiese navorsing in die Drakensberge

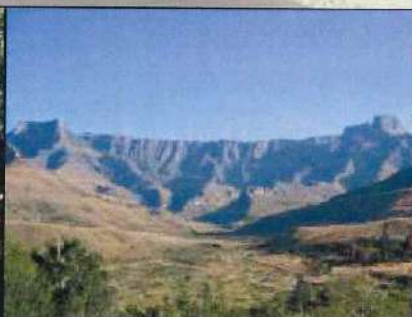
Leon Meyer



Die Drakensberge is bekend vir algemene staproetes en beeldskone natuur, maar min mense weet wat mikroskopiese aangaan in die berge. Die padda spesies wat in hierdie berge voorkom, is besmet met die patogeniese fungus, *Batrachochytrium dendrobatidis* (chytrid fungus) wat die voortbestaan van populasies bedreig. Hulle dra egter nie alleen hierdie las nie. Regoor die wêreld is amfibieër populasies besig om af te neem en sommige spesies is besig om uit te sterf. Hierdie vooruitsig noodsaak dus die bewaring en uitvoer van navorsing op amfibieë.

Ons doen navorsing oor chytrid-infeksies op twee padda spesies in die Drakensberge asook, die invloed van omgewingsfaktore op die infeksiepatrone. Die eerste spesie, *Heleophryne natalensis* (Natal spookpadda) kom voor in Royal Natal Natuurreservaat, aan die voet van die berg en bewoon vinnig-vloeiende rivierstrome. Die tweede spesie, *Strongylopus hymenopus* (Berg stroompadda) kom bo-op die berg by Mount-aux Sources voor, sowat 3000 m bo seevlak, in stadiger-vloeiende strome.

Daar word meestal paddavisse versamel omdat die paddavisse reg deur die jaar in die strome voorkom. Om die paddavisse te versamel verg baie ure se stap, sowat ± 105 km in die berge en deur waterstrome en soms ook in reën en swaar weer - maar wat is veldwerk sonder reën? Elke twee maande word daar data in die berge versamel en in die tydperk van 'n week word daar by 28 perséle paddavisse versamel en bestudeer. Slegs *Heleophryne natalensis* kan in die veld bestudeer word omdat die paddavisse groot genoeg monddele besit om infeksies met 'n 10x handlens te kan waarneem. *Strongylopus hymenopus* aan die anderkant moet teruggeneem word na die laboratorium toe waar daar deur 'n mikroskoop gekyk moet word om te sien of die paddavis geïnfecteer is. Daar is gevind dat die paddavisse die meeste tydens die koeler maande geïnfecteer is. Dit is ook die tyd wanneer vrektes van *S. hymenopus* voorkom. Sover lyk dit of daar 'n verwantskap bestaan tussen vrektes en die paddavisse se broeiseisoen. Die projek vorm deel van 'n langtermyn moniteringsprojek en wil ook ander faktore ondersoek om hul invloed op die infeksies te bepaal.



Vaar wel



Yvette Brits, 'n gebore Pretorianer, het so 30 km van Pretoria, in Hartbeespoort groot geword waar sy ook gematrikuleer het. Haar voorliefde vir plante het begin saad skiet op 'n baie vroeë ouderdom by hul kweekery in Phalaborwa en het begin blom in haar voorgraadse studies in 2003 op die PUK met die hoofvakke Plant en Dierkunde. In 2006 skryf sy in vir die honneursgraad in Ekologiese Remediering en volhoubare benutting, onder die bekwame hand van Prof. Klaus Kellner. Sy pak die M.Sc. in Omgewingswetenskappe aan, met die fokus op bestrykte en onbestrykte grassaad wat in rehabilitasie- en restaurasieaktiwiteite gebruik word en voltooi dit suksesvol in 2007. Sy is 'n Inwoner van Wanda Dameskoshuis vanaf die jaar 2003 tot en met einde Maart 2008 waar sy sagtehal vir die koshuis se eerstespan gespeel het. Aanvanklik sou sy haar PhD studies in 2008 begin het, maar in Maart 2008 aanvaar sy 'n betrekking by die Departement Landbou, Bewaring en Omgewing, Potchefstroom, Noordwes as Landbouwetenskaplike Aangeplante weiding, waar sy met seën van Bo, hopelik 'n goeie biomassa produksie sal lewer.

Redaksioneel

'n Woord van Dank

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Newsletter of the Focus Area of Environmental Science and Management - **Totsiens tot** *Free State University*
die volgende uitgawe!!!