

Researchers go to the birds

A Stellenbosch masters student is conducting an innovative experiment to determine the role of pollination in the survival of fynbos, writes **John Yeld**

MANY of the hikers and mountain bikers who enjoy the tranquil beauty of the Jonkershoek Nature Reserve near Stellenbosch are oblivious to 12 slightly darker, even-sided patches in the cloak of near-pristine fynbos that covers much of the mountainside.

Yet these patches – actually old fishing nets strung tautly over wooden posts, six on either side of the valley – are the sites of a major field experiment, the latest in a research series in Jonkershoek stretching over decades that has produced some of our most important knowledge about the globally significant fynbos ecosystem.

This particular experiment is designed to measure the ecological impact of removing birds from the system – how it will affect vital functions like pollination, seed production, seed predation by other species and potentially increased herbivory on the plants by insects, perhaps all culminating in what might be a significantly different plant and animal community after fire.

This research is the work of Stellenbosch University masters degree student Pieter Botha, supervised by Associate Professor Anton Pauw of the department of botany and zoology, who is an evolutionary ecologist specialising in animal interactions.

Much of our current knowledge about fynbos has derived from long-term studies in the Jonkershoek Valley, Pauw notes. These include research into the impact of fire and invasive alien plants on fynbos vegetation and on fynbos water catchment areas, for example. What's been missing is detailed information about the impact of birds on fynbos, and specifically at a community level.

There have been previous studies that have focused on specific plant-animal interactions, but nothing that has really looked at the “big picture” of birds and fynbos, including their role both as pollinators and predators of insect herbivores.

“So our focus is very much on the community level in this study – this is the gap that we're hoping to fill,” Pauw says.

So how does one set about simulating a “world without birds”? Well, you actually have to physically exclude the birds, and this is where the dark patches come in.

Botha and Pauw have constructed a netted cage

20 metres square so that birds are totally excluded from a surface area of 400m² of fynbos, at each of six carefully selected sites around the valley dominated by bird-pollinated plants.

The mesh of the net had to be fine enough to keep out small juvenile birds, like the endemic Orange-breasted Sunbirds, but big enough to allow insects through. It also had to be UV stable to deal with the long exposure to the sun – the experiment will be running for three years – and strong enough to keep baboons out, Botha explains. It was a delicate balance to achieve, but after “quite a search” they eventually settled on very strong fishing nets with a 2cm x 2cm mesh.

Then, to ensure that the experiment wasn't contaminated by the shading effect of this netting on the plants, they also set up a controlled shaded area at each site that was open on all sides to allow birds in. These are slightly smaller, 10m x 7m, so that birds can fly freely right through and not feel intimidated in the centre area.

Botha started his masters at the beginning of last year and the cages were constructed last August after a lot of hard preparatory work.

“It all took some time – getting the permissions, designing the experiment, finding the contractors and so on,” he remembers.

Fortunately Stellenbosch is a major hub of the viticulture industry, meaning there are contractors available who are very experienced at putting trellises in vineyards.

“We worked closely with these contractors and the design of the cages was done with them – they have lots of experience in putting in poles and getting wires taut and so on. And it was relatively challenging. The material is heavy and bulky and it all had to be carried up to the sites that are rocky.”

Three of the bird exclusion cages and their complementary shade-exclusion “roofs” – everything will be removed at the end of the experiment – were constructed on the warmer north-facing slopes where the dominant bird-pollinated plant species are three Proteas: the waboom or wagon tree (*Protea*), the narrow-leaf sugarbush or blackbeard sugarbush (*Pteris*) and the common sugarbush (*Protea*).

On the cooler south-facing



EXPERIMENT: Stellenbosch University botany professor and pollination specialist Anton Pauw, left, and his masters student, Pieter Botha, at one of six bird exclusion sites in the Jonkershoek Valley where Botha is doing his research.

slopes of the valley, the green sugarbush (*Protea*), common pagoda or rooistompie (*Mimetes cucullatus*) and the needle-leaf pincushion (*Leucospermum lineare*) are in the majority.

“These are all quite dominant bird-pollinated plants, and there are also other bird-pollinated species like the ericas and the irises,” Pauw says.

The major bird pollinators involved are the Orange-breasted Sunbird, the spectacular Malachite Sunbird, and the Cape Sugarbird that is also endemic to fynbos. There are lots of nests in the area – sunbirds and sugarbirds, and a few nests have been established right next to the cages, so the birds have clearly accepted their slightly altered landscape, says Botha.

He gathers data from the sites by standing at each one observing for 20 minutes at a time, five or six times a day.

“I just stand and look at the birds, and I've learnt now to



IMPACT: Masters student Pieter Botha is looking at the impact on seed production in fynbos plant species, like this protea, if birds are excluded.

stand very still for a long time!”

But it also means he has a chance to observe other elements hikers and mountain bikers might miss – “It's been great, I've seen lots of things, klipspringers. When you spend a lot of time in the field, you see

BSc degree followed by an honours specialising in biodiversity and ecology.

“I grew up hiking and mountain biking here in Jonkershoek, spending time in the mountains – I love this valley,” he says.

He has two field assistants who monitor another cage at exactly the same time as he does so he can compare results and avoid biases of weather impacts or different times of the day. They also monitor insects at the sites, looking at the same plant species, and are also doing seed counts.

Last month, Pauw attended a United Nations Environment Programme meeting in Bonn, Germany where the focus was on pollination.

“It's a big issue and especially important from an agricultural perspective – is there a global decline in pollinators?” he says.

“But it's even more important in fynbos because of fires every 15 years or so. Fynbos plants have these very

short life cycles (compared to plants in other ecosystems) and then they have to start all over again from seed, so they need quick and efficient pollinators. And it's very important to know how significant birds are in this process, because we do lose them to things like fires, pesticides and habitat loss.”

There could be “cascading effects” of such losses, particularly because birds have a dual role as pollinators and also as predators of insects – they feed on a lot of insects, particularly when they're raising chicks, Pauw explains.

“If the lack of birds causes a meaningful reduction in seed production (because of less pollination), we expect to see that the new veld will lack bird-pollinated plants and will instead be dominated by insect and wind-pollinated plants, including invasive aliens.

“So all-in-all, we hope to be able to give a definitive answer to the ecological question of whether birds really matter.”



DOMINANT: The narrow-leaf sugarbush, also called blackbeard sugarbush (*Protea. nerifolia*), is one of the dominant fynbos plants in the Jonkershoek Nature Reserve.



POLLINATOR: The Malachite Sunbird is an important pollinator of fynbos plants. This particular bird was photographed at Cape Point, not in Jonkershoek.



ENDEMIC: The Cape Sugarbird, one of only six birds endemic to fynbos, is an important plant pollinator. This particular bird was photographed at Cape Point.

Unsung heroes with a healing touch

KOWTHAR SOLOMONS

VOLUNTEERS at Cape Town Hospitals are unsung heroes who help ease the burden on overworked staff, provide comfort to patients and sacrifice their personal time to make a difference.

Despite some of the challenges, they say the work is its own reward.

Not only do they take care of some of the physical needs of the patients but expose themselves to psychological trauma.

Gigi Werthens has been a volunteer at Groote Schuur Hospital for more than 30 years. She volunteers once a week and is part of the trolley service, an initiative that has been duplicated at Tygerburg Hospital.

“We sell soup and sweets and all kinds of other things to the outpatients. Any money we make is given to the Benevolent Society which distributes it through a social worker to patients who need clothing, food or transport money. At the end of the year we use the money to buy groceries for those less fortunate.

“The work we do is very rewarding. I started volunteering after my husband died of cancer. My first day on the job was to help cut the hair of men who had cancer, but it was a bit too much for me.



LIFTING SPIRITS: Volunteer Claire Hoffman holds Yibanathi Brintjies at the Red Cross War Memorial Children's Hospital.

Giving is really more rewarding than receiving.

“Unfortunately we don't have as many volunteers as we used to have because volunteers have to pay for transport themselves, but it is really rewarding knowing you are making a difference in people's lives,” Werthens said.

At Tygerberg Hospital, volunteers also provide a personal touch to their patients.

Lilian Layman, a former nurse, has volunteered at Tygerburg once a week for the past 11 years and washes patients' hair. While it may seem like a simple task, it provides patients with much-needed physical contact.

“Being sick is more than physical, it's psychological as well. Many of the patients are from far away, like for example, Grabouw and their family can't visit them. Others don't have

any family. They can feel unwanted or unloved but just that physical contact can make so much difference.

“I've seen patients cry from joy when we're done with their hair. We also talk and provide counselling and do our best to make them feel comfortable.”

Claire Hoffman has been a volunteer at the Red Cross Children's Hospital for more than 28 years.

Each Wednesday Hoffman reports to the transplant unit and spends a few hours with children who are about to have or have just had life-altering surgery.

“It's fun just to play with the children and often you find them more accepting of their circumstances than adults and although they start off shy, they warm up to us very quickly,” Hoffman said.

“Of course there are times when you might lose someone but there is more success. We also talk to the parents who might need someone outside the medical field who can relate to them.”

Cami Palomo, of El Salvador, visited the hospital three years ago as a tourist and after early retirement returned to work there as a volunteer.

“I come in about four times a week and in the burns unit. It can be very rewarding but has its challenges. It's hard to see kids in pain but their innocence gives you strength – and more than you give them.

“Some of the children are here for more than eight months. It's hard to see them bandaged up and barely able to move but through love, and one of my favourites, music, they leave here walking and smiling. The doctors, nurses, physiotherapists and everyone else here do wonderful work.”

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Comedians put brave face on depression

MARIE FRENCH and SONALI BASAK

NEW YORK: When you think of Ellen DeGeneres, Conan O'Brien, David Letterman and Robin Williams, the first word that comes to mind isn't depression.

But the four comedians have all struggled with the disease suffered by an estimated 350 million people worldwide, according to their own comments or those close to them. Williams, a comedian known for his manic energy, committed suicide on August 11 at the age of 63. He had suffered a period of severe depression, his publicist, Mara Buxbaum, said in a statement.

“Not everybody who has a depression disorder gets recognised,” Paul Summergrad, the president of the American Psychiatric Association, said. “It affects rich people, it affects poor people, it affects people across the spectrum.”

Symptoms vary and can include feelings of hopelessness, extreme anxiety, appetite changes, insomnia or excessive sleeping, and suicide risk, according to the National Institute of Mental Health in Washington. Depression often



BLUES: Ellen DeGeneres has battled depression.

occurs with substance abuse, according to the institute.

Treatment could include a combination of prescription drugs and talk therapy, said Jeff Borenstein, the president of the Brain and Behaviour Research Foundation.

For many people, multiple drugs must be tried, or a combination of drugs, before finding a treatment that worked, he said. “It is a physical condition that affects the brain,” Borenstein said.

“The symptoms include feeling depressed, obviously. But it also can include difficulty functioning at work, home or at school, inability to enjoy oneself, and low level of

energy, difficulty concentrating and, most importantly, thoughts of wanting to kill oneself.”

Drugs used to treat the disease include Prozac, Zoloft and Paxil. Side effects can include nausea, dizziness, insomnia and weight gain or loss. They belong to a class of drugs called selective serotonin reuptake inhibitors, which build up levels of a chemical in the brain, serotonin. The lack of serotonin has been associated with depression.

It's a class of drugs that's been controversial in the past because of a link to suicidal thoughts. They now carry warning labels that advise close monitoring when patients start on the medication.

Recently, investigators at Johns Hopkins University in Baltimore published research on a gene tied to negative thoughts and impulses. It might lead to a blood test predicting suicide risk, they said. The research, published in the *Journal of Psychiatry* in July, adds to recent genetic discoveries in psychiatry that promise to advance treatment and diagnostics in the field.

Suicide is the 10th-leading cause of death in the US. – Washington Post