

# *African* WILDLIFE & ENVIRONMENT

ISSUE 72

**THE YELLOW-THROATED  
LONGCLAW**

**THE INCREDIBLE  
WHITE  
MILKWOOD**

The reality of  
**RIVER  
REHABILITATION**

THE MAGAZINE OF THE WILDLIFE AND  
ENVIRONMENT SOCIETY OF SOUTH AFRICA



**WESSA**

PEOPLE CARING FOR THE EARTH

# Region, area office, branch & centre CONTACTS

## EASTERN CAPE

- Regional Representative | Jenny Gon | Regional Representative & Board | 079 038 6809 | j-gon@intekom.co.za
- Regional Committee | Mervyn Brouard | Regional Chair | 082 875 4210 | mpb@telkomsa.net

## BRANCHES

- Algoa Bay | Gary Koekemoer | Branch Chair | 071 610 2884 | garyk22@me.com
- Grahamstown | Eileen Shepherd | Branch Chair | 078 099 7711 | deshepherd1906@gmail.com

## KWAZULU-NATAL

- Regional Committee | Pieter Burger | Regional Representative & Board | 031 573 1054 | pieter@burgerip.co.za
- Regional Committee | Margaret Burger | Regional Chair | 083 630 5380 | margaret@burgerip.co.za
- Regional Committee | Jenny Duvenage | Regional Coordinator | 031 303 6099 | kzn.membership@wessalife.org.za

## BRANCHES

- Durban | Margaret Burger | Branch Chair (Acting) | 031 573 1054 | margaret@burgerip.co.za
- Highway | Jean Senogles | Branch Chair (Acting) | 031 764 0034 | jeansenogles@gmail.com
- Kingsburgh | Rob Jack | Branch Chair | 083 799 9241 | robjack6@gmail.com
- Midlands | Dale van Ryneveld | Branch Chair | 033 343 3132 | suevr@yebo.co.za
- Sani Wildlife | Russel Suchet | Branch Chair | 083 987 3071 | info@sanilodge.co.za
- Southern KZN | Paddy Norman | Branch Chair | 084 285 1821 | paddyn@telkomsa.net
- Upper South Coast | Bob Skippings | Branch Chair (Acting) | 031 914 2158 | skippy@icon.co.za

## LOWVELD

- Regional Committee | Ricky Pott | Regional Representative & Chair | 083 630 1782 | rpott@mweb.co.za

## NORTHERN AREAS INCORPORATING FREE STATE

- Regional Committee | John Wesson | Regional Representative & Chair | 083 444 7649 | jwesson@wessanorth.co.za
- Regional Committee | Leanne Ray | Regional Coordinator | 082 511 6308 | leanne.annie@gmail.com
- Regional Committee | Marion Mengell | Friends Group Advisor | 012 667 2183 | friendsnylsvley@mweb.co.za
- Regional Committee | Willem Hazewindus | ARMOUR & Groot Marico Projects | habiwax@worldonline.co.za

## BRANCHES

- Boksburg | Nils Bjornstad | Branch Chair | 082 576 2781 | mary@vikingprojects.co.za
- Springs-Nigel | Dee Johnson | Secretary | 011 730 2059 | battybird6@gmail.com
- Tshwane | Carol Martin | Chair | 082 772 2498 | carolma@telkomsa.net
- Kempton Park Zone | Martin Hedington | Zone Coordinator | m.l.hedington@gmail.com
- Paul Roux Town Zone | Dr Richard Lewis | Zone Coordinator | richard@richardlewis.co.za

## WESTERN CAPE INCORPORATING NORTHERN CAPE

- Regional Committee | Dr Graham Avery | Regional Rep, Chair & Green Coast | 072 658 6210 | drgavery97@gmail.com
- Regional Committee | Isabel Collett | Treasurer & Minutes Secretary | 076 407 5727 | isabel.collett@gmail.com
- Regional Committee | Annette Venter | Regional Coordinator | 071 684 3435 | wessawesterncapemembers@gmail.com
- Regional Committee | John Green | Strategic Planning & Institutional History | 083 504 8942 | greenhse@mweb.co.za
- Regional Committee | Phil McLean | Friends Group Advisor | 082 963 5757 | fynbosphil@yahoo.com
- Regional Committee | Mea Lashbrooke | Friends Group Liaison | 074 101 1927 | meatjie@gmail.com
- Regional Committee | Axl Maas | Portfolio: Youth Engagement | 073 119 9186 | axlmaas@gmail.com
- Regional Committee | Susan Gie | Portfolio: Citizen Science | 082 577 2025 | susan@gie.co.za
- Regional Committee | Patrick Dowling | Portfolio: Climate Change & Energy | 084 966 1249 | patrick@tops.org.za

## BRANCHES

- Eden (George-Sedgefield) | Christine Ridge-Schnauffer | Branch Secretary | 044 873 4203 | wessageorge@isat.co.za
- Hottentots Holland | Paul van Elzen | Branch Chair | 072 335 9301 | hausmeister@mweb.co.za
- Knysna-Plett | Steve Gettliffe | Branch Chair | 044 384 0289 | stevebar@barkly.co.za

## ENVIRONMENTAL EDUCATION CENTRES

- WESSA Treasure Beach | 835 Marine Drive, Bluff, Durban KZN | 031 467 8507 | matthew.cocks@wessa.co.za
- WESSA Twinstreams | Mondl Estate, Village Road, Mtunzini KZN | 035 340 1641 | twinstreams@wessa.co.za
- WESSA uMngeni Valley | uMngeni Valley Reserve, 1 Karkloof Rd, Howick KZN | 033 330 3941 | reservations@wessa.co.za
- Umbogavango | Umbogavango Reserve, Umbogintwini Industrial Complex KZN (managed by Upper South Coast Branch)
- Bush Pigs | PO Box 2247, Modimolle, 0510, Limpopo | 014 717 1285 | admin@bushpigsedu.co.za

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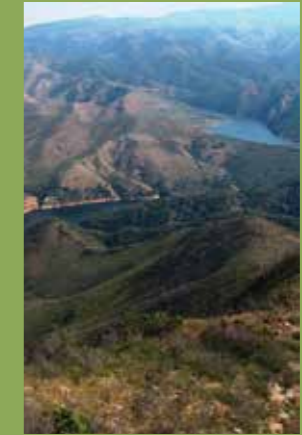
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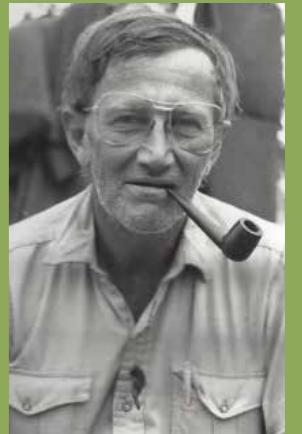
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**WESSA**  
PEOPLE CARING FOR THE EARTH

Consulting Editor

John Ledger  
editor@wessaregion.co.za

Production Manager

John Wesson  
managerawe@wessaregion.co.za

Design & Layout

Marlene McKay  
design@wessaregion.co.za

Editorial

John & Jenny Wesson  
editorial@wessaregion.co.za  
Tel +27 31 201 3126  
www.wessa.org.za



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## EDITORIAL

Dr John Ledger

**This morning just before putting pen to paper (or finger to keyboard) I heard a report quoting the CEO of Eskom saying that South Africans can expect load-shedding for the next six months. Once one of the world's leading electricity utilities, Eskom has been brought to its knees, leaving the country, our economy and millions of South Africans vulnerable.**

**B**ut bleating is not going to help turn the lights on. This is going to be a long and slow process. We need to look after ourselves. I have been teaching energy topics at both Wits (for 17 years) and UJ (seven years), and so I thought it appropriate to share my take on looking after ourselves with readers.

When the power goes off at night, we need lights. There are plenty of torches around that either use batteries or are rechargeable. Batteries go flat, and we sometimes forget to buy new ones. My favourite emergency light is the 'Solar Top', an ingenious little solar light that you leave in the sun to charge its lithium-ion battery. For every hour in the sun, you get an hour of light. The unit has four bright LEDs, and fits very nicely on a 2 litre plastic cool drink bottle, or on top of a 750 ml wine bottle. I like the latter arrangement, because drinking the wine helps with anger management against Eskom. These light are a bargain at R150 each.

My next favourite is the 'Magneto' lantern from Makro or Builders Warehouse at R200 (all stocks sold out this week!). This is rechargeable from the mains, has two power settings, and a USB socket for charging your cell phone. A super feature is that you can leave it plugged in and charging, and the moment the power goes off, the light switches on. It also has a socket for a six volt DC plug, and you can buy a five watt solar panel to charge this lantern in areas without electricity. This is an excellent solution for folk in rural areas.

Now most of us use computers rather than pen and paper these days, and if you use your computer as much as most people, you need to keep working when the power dries up. Here many people have a UPS (Uninterruptable Power Supply) that switches over to battery power in milliseconds, so you don't lose your work. Most of the smaller UPS models are only intended to run for about 10-15 minutes so you can save your work or finish what you are doing. They generally have small batteries, and have limited value during a four-hour load-shedding session.

The next step up is an inverter/ charger that also runs off the mains, but you can add extra batteries to give you longer running time. They come in all shapes

and sizes, and one unit that I am familiar with provides about 1,200 watts of power and needs two 12 volt batteries. The unit costs R3,000, and 50 amp hour batteries cost R1,100 each (total cost around R5,200), while 100 amp hour batteries are R2,100 each (total cost around R7,200). The bigger batteries give you longer running time, and this of course depends on the load you expect to support during outages.

Now, what about solar power? In the long run, a well-designed solar system is a good investment, but it is an expensive option. An average household will require around five kilowatts (5kW) of electrical power, and should also have a gas stove and a solar water heater (budget R18,000 for the latter, and a good gas stove is anything from R8,000 up.) Before me is a brochure from Current Automation, one of the big hitters in the solar power game. Their five kW system costs R67,360 and they say it will run for 4-6 hours. This is big money that very few of us keep under the mattress!

My suggestion to readers is to buy the biggest inverter/ charger you can afford, and add enough batteries to get you through load-shedding in the coming months. Then over time, and according to budget, add additional batteries, some solar panels and a solar charge controller so that you can start charging the batteries from the sun rather than from the mains. With the right choice of the inverter/ charger from the start, you could build up a very handy solar system over a few years.

Readers are invited to contact me for free advice on these topics. There are many different solutions to solar power, and there are many eager salespeople out there trying to persuade you to buy their wares. Caveat emptor is Roman-speak for 'buyer beware'. It is especially true at these times...

**Dr John Ledger**

Consulting Editor  
john.ledger@wol.co.za  
083 650 1768

<https://www.facebook.com/john.ledger.5661>

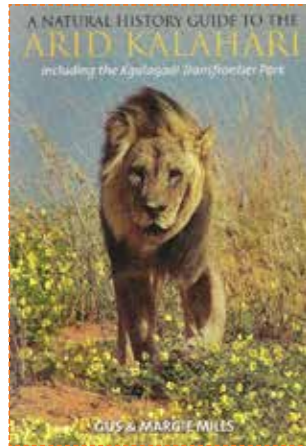


*Environmental education is vital to ensure the protection of our natural resources  
Read the article on page 33*



## GOOD READS

Book reviews by Dr John Ledger

**Kalahari**

Mills, Gus & Margie (2013). A Natural History Guide to the Arid Kalahari including the Kgalakgadi Transfrontier Park. Crocuta Publishers, Sonpark, Mpumalanga. Soft cover, 14x21 cm, 200 pp, illustrated in colour throughout. ISBN 978-0-62053-299-0. **R200 plus delivery.**

[To order send an e-mail to margsmills@gmail.com. You will receive an invoice with banking details, and the book will be dispatched on receipt of your funds.]

This book is a classic guide to the arid Kalahari, written by two people who know it better than most. Gus and Margie first went to the Kalahari in 1972, and then Gus spent the next 40 years doing research on large carnivores in both the Kalahari Gemsbok and the Kruger National Parks. On his retirement, Gus and Margie went back to the Kalahari in 2006 and they spent six years doing a detailed study of the cheetahs of this arid region.

In May 2000, two protected areas in South Africa and Botswana were joined together as the 37,256 square kilometre Kgalakgadi Transfrontier Park by the Presidents of SA (Thabo Mbeki) and Botswana (Festus Mogai) at a ceremony in the Kalahari (I was there!). With additional land on the Botswana side, the total wildlife management area is about 80,000 square kilometers, making it one of the largest conserved areas in the world.

Longer chapters deal with Antelope, Hyaenas, The Cats, Other Carnivores, Birds can Fly, The Smaller Fry, and Visiting the Kalahari. There are also checklists of mammals, birds, amphibians and reptiles and plants. This modest little book is packed with information for visitors to this fascinating part of the world – it is a ‘must-have!’

**East African Parks**

Stuart, Chris & Mathilde (2018). Stuarts’ Field Guide to National Parks & Game Reserves of East Africa. Struik Nature, an imprint of Penguin Random House South Africa (Pty) Ltd, Cape Town. Soft cover, 13x19 cm, 248 pp, illustrated in colour throughout with photographs and maps. ISBN 978-1-77584-062-6. **R320.**

The Stuarts are a formidable team when it comes to writing scientific papers, popular articles and a range of books on African mammals, wildlife and conservation areas. Their latest offering provides a compact and useful overview of some 58 protected areas across East Africa. The book is divided into sections covering the countries of Tanzania, Kenya, Uganda and Rwanda. For each of the parks described, there is background information on the geology and landscape, climate, vegetation, and of course the wildlife, capturing the essence of what each park offers, as well as a brief history.

The book features numerous excellent colour photographs of animal and plant life, as well as landscapes. Mammals, birds, reptiles and amphibians are well represented, and there is a useful photographic identification guide from pages 209 to 246 at the back of the book. There are also detailed park maps, indicating places of special interest and the best sites to view key species. It packs an incredible amount of information in its relatively compact 248 pages. There are valuable alerts about safety when game-viewing, about tsetse flies and malaria, the risk of altitude sickness if attempting to climb some of East Africa’s high mountains, and other useful tips. This book will be indispensable to local and international eco-tourists to the region, and ‘armchair explorers’ will find it fascinating reading for planning that ‘bucket trip’ to the famed East African parks.

**Elephant Politics**

Pinnock, Don & Colin Bell (Compilers) (2019). The Last Elephants. Struik Nature, an imprint of Penguin Random House South Africa (Pty) Ltd, Cape Town. Soft cover, 21x25 cm, 488 pp, illustrated in colour throughout with photographs, maps and sketches.

ISBN 978-1-77584-684-0. **R490.**

This is indeed a ‘blockbuster’, as its large dimensions and many pages imply. It has spectacular photographs of African Elephants and African landscapes, and for this alone it is a book to be enjoyed. It also provides a fascinating insight into elephants and conservation in some little-documented African countries, such as Gabon, Democratic Republic of Congo, Congo Brazzaville, Central African Republic, Republic of Togo, Chad and Mali. In several of these countries, private / public partnerships between the NGO African Parks and host governments have achieved much conservation success. With a requirement of a 25 year lease from each government, African Parks has turned around many neglected African parks, and shown what can be done with the right attitude and expertise. This is a counter to the gloomy future portrayed for African Elephants by this book.

In my view, *The Last Elephants* is a powerful piece of propaganda for the protectionist, animal-rightist and anti-hunting movement- people who by and large do not live permanently in rural Africa alongside large and dangerous animals. Many only visit rural Africa to conduct their ecotourism businesses, or to do exciting and career-enhancing research in wild and remote places, and then return to their comfortable homes in Europe, the USA or Cape Town. Here is the motivation for this book:

“We hope this book will fulfil three wishes: Firstly, that readers from around the world will enjoy these compelling elephant accounts and beautiful photographs. Secondly that the delegates to CITES CoP 18 in Sri Lanka, May 2019, use it to make wise and informed decisions to close all loopholes in the ivory trade. And thirdly, that countries receiving and using both legal and poached ivory – primarily China, Vietnam, Laos and Japan – ban and strenuously police its trade and use within their borders, actively pursuing and arresting syndicates who drive the cruel poaching tsunami.”

So, here we go again, another call for CITES to repeat the failed bans on trade that have seen how rhino horn and elephant ivory continue to be in demand in certain parts of the world, and how the futile and obtuse efforts to ban the trade in rhino horn for 40 years has not done anything whatsoever to conserve these animals. When will CITES, and the prohibitionists who influence its decisions, ever learn that continuing to do more of the same thing and expect a different outcome is a sure sign of lunacy?

I thus urge readers to enjoy the wonderful photographs, but be cautious about much of the content, because it is biased, selective and mainly addresses only one side of the African Elephant management conundrum. When one reads about things where you have personal experience, this can be an indication of the quality of the content of the whole book.

I know something about Namibia, and I found the information provided about this country to be appalling. There is only one article under the country heading ‘Namibia’. This is an academic article about ‘Desert-dwelling elephants of north-west Namibia’, starting on page 273. We read about ‘social structure’, ‘male and female society’, ‘genetic links’, ‘feeding activities and defaecation rates’, ‘water’, ‘resting’, ‘coprophagy’ (for goodness’ sake!) and ‘thermoregulatory behaviour’.

But nowhere, folks, *nowhere* is there any mention of Namibia’s success in community-based conservation, of its massive community conservation areas, of its government’s unwavering support for both trophy hunting and subsistence hunting, of the benefits that have flowed to rural communities through a balanced approach towards sustainable consumptive wildlife utilisation, alongside ecotourism opportunities. How does Namibia manage conflicts between rural communities, elephants and lions, for example? Why does this book choose to ignore the success story of conservation in Namibia, and makes no mention of one of the most significant books on the region, *An Arid Eden*, by Garth Owen-Smith?

Much too is made about the CITES-approved limited sales of ivory stockpiles held by southern African countries in 1999 and 2008. This is blamed for the resumption of elephant poaching that had allegedly been halted by the ban previously in place. My conversations with TRAFFIC over the years indicate that this conclusion is not borne out by the facts. One author goes so far as to say that South Africa, Zimbabwe, Namibia and the European Union and others “have much on their collective conscience. Assuming they have one.” Gosh!

And another of the chapter authors says this about the above ivory sales: “The result is today’s ivory crisis, where around 30 000 elephants are poached annually throughout Africa – an elephant dies every 15 to 20 minutes. To make matters worse, not one cent of the proceeds from the ivory sale was ploughed back directly into conservation.”

This statement is blatantly untrue; Namibia ring-fenced all its proceeds from the ivory sale for conservation expenditure. I have visited community-owned and managed tourist lodges in the Caprivi that were built with the funds from the much maligned ivory sales.

No review cannot do justice to this book, nor go into a detailed argument about a re-think of the ‘ivory crisis’. I do know one thing – trade bans have never worked in the past and there is no reason to think they will solve this ‘crisis’. It is time for a different approach, and hiding one of Africa’s conservation success stories is not a very convincing way to win a spitting contest.



## The reality of RIVER REHABILITATION

Dr Anthony Turton

**The recent news about the plight of thousands of flamingoes in Kamfer Dam has brought a national crisis into focus. The Sol Plaatje Municipality is distressed. One of the most visible indicators of distress in any municipality is the state of the sewage works they manage. Stated in its starkest simplicity, thousands of flamingos are dying because a sewage works has failed, but this is not a localized incident.**

Civilisation as we know it started with the Romans who solved one fundamental problem. How to bring enough humans into a defined space to unlock the benefit of a division of labour and specialisation without the risk of disease? The drivers of this problem are juxtaposed in a stark manner. On the one hand, the potential benefit of cooperation among a population that is encouraged to specialise in certain skills is also capable of sustaining a system of taxation that is needed to deliver fundamental services to that society. On the other hand, the denser the population, the greater the risk of disease. The Romans became the first to balance out these two mutually exclusive drivers and by so doing modern civilisation was created.

At the heart of this great achievement was the ability to bring water into a defined area, distribute it to paying users and then collect all the hazardous human waste for transport and disposal outside of the urban limits. Aqueducts enabled water to come in and water-borne sewers allowed waste to flow out. This simple balancing act became the foundation of civilisation, and the civil engineer was born. The title 'civil' speaks to this recognition.

South Africa is a country of great challenges. One of the enduring challenges has been the provision of water into communities, and the removal of waste from those same communities. Water is an economic enabler, so its absence is the foundation of endemic poverty. The genesis of this thinking, at least in a South African context, dates to 1886 when a young road engineer named Thomas Bain wrote a book entitled *Water-finding, Dam-making, River Utilisation, Irrigation*. The insight for this book came from his travels in the arid parts of the Northern Cape, in the very same area as the flamingo crisis is currently playing out. Bain was particularly impressed by what he saw at a small mission station near present day Upington. He noted that great prosperity had arisen from the simple act of diverting water from the Orange River to irrigate large tracts of land that

were otherwise parched and barren. Being a road engineer, he began mapping contours and he came to the startling conclusion that it was possible to divert water from the Orange, for delivery on the other side of the continental watershed divide, to present day Port Elizabeth.

Bain became the first Director in the newly established Department of Irrigation, and his vision of water as an economic enabler was captured in his book. This is what I call the First Hydraulic Mission that was focused on water for agriculture. It was not until 1960, a century later, that this vision became a reality. After the Sharpeville crisis and the birth of the 'Armed Struggle', investor confidence was lost. The leadership at the time, deeply impressed by what had happened in the USA where government had intervened in the economy by creating the New Deal to counter the boom-bust cycles of the early 20th Century, decided to recognise water as an economic enabler. This vision, informed by the Tennessee Valley Authority (TVA) in the USA, revisited Bain's idea and the Orange-Fish-Sundays Inter-Basin Transfer was born. This was the Second Hydraulic Mission centered on pushing rivers around by heroic engineering, driven by the need to create jobs, grow the economy and restore investor confidence in South Africa.

This policy saw the massive injection of capital into the economy, as the infrastructure was built to sustain an economy diversifying from agriculture to mining and heavy industry. The effect of this in economic terms was a sustained period of growth in the order of 7% pa, referred to by some scholars as The Midas Touch.

The unintended consequences of this were many. Space allows me to only deal with the environmental aspect, because almost every river of consequence was connected to every center of economic development, as water flowed uphill to power and money. The environmental consequences were dire, because aquatic ecosystems in naturally arid areas are driven by their highly episodic hydrology. These rivers

*Partially treated sewage being discharged into the Apies River from the Rooiwal WWTW in Pretoria.  
(Image courtesy Anthony Turton)*



are said to have a distinct flood pulse, but this was so severely altered by the number of dams and inter-basin transfers, that they ran the risk of reverting to open sewers.

This brings us to the sewage crisis. You see, because water is an economic enabler, when engineers provided it into cities in semi-arid areas, people flocked to the jobs being created. The greater the extent of water security, the stronger was the economic growth, so the greater the attractive force for unemployed people looking for nothing more than a dignified life that comes with doing an honest job. This created a new challenge, because the more urban and industrial centers grew, the more engineering skills were needed to build and maintain the complex infrastructure, and the more sewage was produced that also had to be managed.

This takes us back to the Romans. Their civilisation could only grow as far as water-borne sewage would allow it. They did not have the technology to treat the waste by rendering it free of pathogens. All they could do was dispose it into the nearest river. There was therefore a finite limit to the extent that any city in the Roman Empire could grow. Sewage was the limiting factor. This came to a head in August 1858 in the city of London, in an event that historians refer to as The Great Stink. A period of hot weather caused the raw sewage in the River Thames to putrefy, and scientists began to establish the causal link between polluted water and human disease. This gave rise to a period of heroic engineering based on a proposal by Joseph Bazalgette. This became the blueprint for all



Partially treated sewage entering a small river from a hydraulically overloaded WWTW. (Image courtesy Anthony Turton)



modern cities as sewers were modernised and waste water treatment works were introduced to render the effluent free of harmful pathogens.

Today in South Africa we have a highly skewed pattern of spatial development. Urban centers are the home to concentrated populations of people, all seeking work and the promise of a better life inherent to democracy. We produce a staggering 5,128 Ml/d of raw sewage. For the layperson, a megaliter (Ml) is one million liters, so that's 5,128 units of one million liters each, or rounded out to 5.2 billion liters. This is produced every single day, irrespective of whether there is a drought or not. To process this massive volume, we have 824 Waste Water Treatment Works (WWTWs), that are only able to treat a meagre 836 Ml/d to a standard that is safe for discharge into a river. Here it must be noted that all sewage effluent is eventually discharged into a river, unless the WWTW is located on the coast, where it is discharged into the ocean. The remaining 4,292 Ml/d is untreated, or at best partially treated, before being discharged back into the environment.

Here it becomes more interesting, because the rivers are already distressed from the half century of heroic engineering that has altered the natural flood pulse through the intervention of dams and inter-basin transfers. All potable water, including water for human consumption and the economy, is processed by 1,085 bulk Water Treatment Plants (WTPs). None of these were ever engineered to take raw sewage and convert it to safe potable water, yet that is what we are expecting of them today. Of these 1,085 WTPs, 250 are no longer working as designed, with the rest in varying degrees of dysfunction. The level of dysfunction is driven in part by the non-payment of water by distressed municipalities like Sol Plaatje.

We thus have a vicious circle at play.

Here is where it gets very interesting. As the state is failing, with the empirical manifestation being the level of functionality of the local WWTW, we are seeing the emergence of a plethora of self-help schemes. Some of these are driven by highly charismatic individuals, who have taken it upon themselves to clean up the local river. In many cases these people have become prophets, with a growing following of angry citizens increasingly willing to support their chosen prophet in his noble quest to clean up 'their' river. These prophets often make claims about silver-bullet solutions that work, or so they claim. They sometimes resort to crowd funding to pay for these unproven silver-bullet solutions. The legality of both the intervention into a complex but distressed aquatic ecosystem, and the raising of money from the public, is questionable.

The fundamental issue that we need to address is one of river rehabilitation. Of this there can be no doubt. Almost all our rivers have now become open sewers, the very thing that the National Water Act of 1998 tried to prevent. But rehabilitation needs



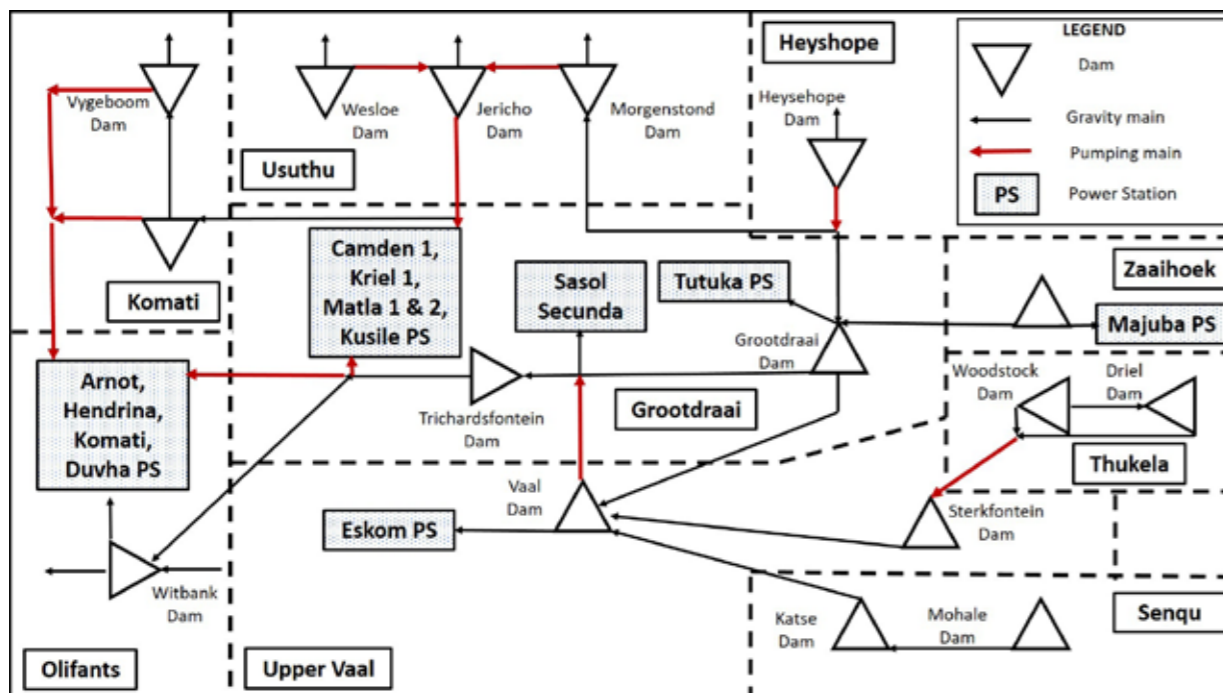
Our rivers flowing out of urban areas have been open sewers (Image courtesy Francois van Vuuren)

to be done in a way that recognises the inherent complexity arising from a highly altered flood pulse, in the face of rapid urbanisation driving the collapse of our WWTWs. This must be done in a way that does not create more angry citizens than we already have. Above all it should recognise that water is an economic enabler, so by default, a destroyed water resource is a profound disabler.

Two prominent NGOs recently made a formal call for the establishment of an Independent Water Regulator. The Organisation Undoing Tax Abuse (OUTA) seeks to ensure the appropriate use of taxpayer's money and Water Shortage South Africa (WSSA) deals with the human impact of failing hydraulic infrastructure. The logic for the creation of the Independent Regulator is to restore good governance and oversight into the water sector to the extent that decisions are rational and legally defensible, and that money is spent on appropriate solutions. In short, the Independent Water Regulator will restore the trust and confidence needed to attract the One Trillion Rand needed to bring our national hydraulic infrastructure up to 21st Century standards.

Those standards include the rehabilitation of aquatic ecosystems consistent with the law, the recovery of water from waste, the desalination of water and safe disposal of brine where appropriate, and the conjunctive use of groundwater as an alternative to large surface storage dams where water will increasingly be lost to evaporation as climate change squeezes society in its relentless grip. By so doing we can again reap the benefits of water as an economic enabler in a prosperous society that respects its few remaining wilderness areas and natural habitat.

**Prof Anthony Turton**  
Centre for Environmental Management  
University of the Free State



Inter-basin transfers of water became the foundation of our national economy in the Second Hydraulic Mission but have created a new and more complex set of environmental challenges as the flood pulse in rivers has been fundamentally altered. (Image courtesy Anthony Turton)

An aerial photograph of the Eastern Cape region in South Africa. The landscape is characterized by rolling hills and valleys with varying vegetation, from dense green forests to sparser, brownish-green scrub. A large reservoir is visible in the middle ground, with a dam structure at its base. The sky is clear and blue. The text is overlaid on the upper right portion of the image.

## Celebrating the diversity of the EASTERN CAPE REGION

The Eastern Cape encompasses amazingly diverse types of vegetation and hosts a number of national, provincial, local and private reserves that celebrate the region's diversity. The vegetation ranges from the Maputaland-Pondoland-Albany hotspot of endemism in the north-east, Alpine vegetation in the north along the Southern Drakensberg escarpment, impenetrable Sub-Tropical Thicket in the south-west, large areas of the Karoo with its highly specialised vegetation types, and in the west, the eastern-most section of the Cape Floral Kingdom World Heritage Site.

Mervyn Brouard and Jenny Gon

*The Groendal Dam in the Baviaanskloof Wilderness Area and World Heritage site*



Incorporated into this World Heritage Site in 2004 is the Baviaanskloof Nature Reserve – one of the largest remaining true wilderness areas in South Africa. The parallel, east-west trending Baviaanskloof and Kouga mountain ranges which bound the Baviaanskloof valley offer spectacular scenery. Here, one can see the effects of the break apart of Gondwanaland, the dramatic folding of the sediments of the Cape Supergroup, remnants of the old African land surfaces, the Baviaanskloof fault line (responsible for the formation of the Baviaanskloof valley) and a prevalence of Enon Conglomerate deposits. Visit the Baviaanskloof with a historian and geologist and prepare to be amazed! Offshore, several of the country's marine protected areas (MPAs) are found along the coast, including the newly declared MPA in Algoa Bay.

WESSA's conservation activity started in the Eastern Cape in 1929, with the formation of the Cape Branch of the Wildlife Protection Society of SA, which evolved into WESSA through the years. The society played a major role in the proclamation of the Addo Elephant National Park in 1931. The society has evolved with time, with vibrant member and staff activity being focused around the hubs of Port Elizabeth and East London, as the Eastern Province and Border-Kei regions, respectively. In 2014 the two regions were merged into the Eastern Cape Region. Membership activities are currently centred in the Port Elizabeth and Grahamstown metropolitan areas, where we have two active branches, both of which are fortunate to be able to draw on the expertise and knowledge of the local universities as a resource and inspiration.

The Algoa Bay Branch was resurrected in 2014 under the leadership of Martheanne Finnemore with a focus theme of 'Know your Bay'. Algoa Bay is considered one of the most highly studied marine environments in the world due to the involvement of the SAEON Egagasini node and various departments and individuals of the Institute for Coastal and Marine Research (CMR) in the new Ocean Sciences Campus of the Nelson Mandela University.

It is also one of the six 'Hope Spots' in South Africa.

The Branch committee is fortunate to have a couple of experienced marine scientists on board, including Dr Lorien Pichegru, who works on foraging behaviours and energetics of Cape Gannets and African Penguins within Algoa Bay, which hosts the largest and very threatened populations of African Penguin remaining in the world. Lorien is also the convener of the Algoa Bay Hope Spot initiative.

Algoa Bay Branch committee members made key inputs into the highly controversial proposed fish farms in Algoa Bay and into the declaration of the Marine Protected Area (MPA) in Algoa Bay. Two other recent interventions made by the Branch were on a proposed sand mining project near a pristine section of the coast at Schoenmakerskop, and on an application for a license to engage in White Shark cage



*Ziyanda Mpati the youth coordinator encouraged several young people to join WESSA at the beach cleanup at Brighton Beach*

diving in the Bay. In both cases, the Branch facilitated community debates to ensure all information was available to residents to enable informed decisions to be made, and is considering expanding this aspect of its work.

The Algoa Bay Branch organizes regular events around its 'Know your Bay' focus-theme. These include monthly beach cleanups, environmental events for learners during Marine Week and well-attended public talks by scientists and community activists on the amazing features and creatures of Algoa Bay. Bayworld kindly makes its conference facilities available for these talks. More recently, the Branch has launched an anti-litter/anti-plastics campaign, and also undertakes clearing of invasive alien vegetation from the Nelson Mandela University Nature Reserve. The Branch has recently published



*Algoa Bay Branch removed plastic and other rubbish from the Baakens Valley that runs through the city. The Blue Flag interns working on our beaches supported the branch*

an educational booklet *Know your Bay: A guide to the features and creatures of our Algoa Bay Hope Spot*.

The Grahamstown Branch is also very active, working closely with Rhodes University, and regularly organises high-calibre educational talks and outings. In 2011, the Grahamstown Branch introduced the concept of an annual Wildlife Experience, which includes the prestigious Jack Skead Memorial Lecture, as well as excursions and other events supported by experts. The 'Wildlife Experience' events are a highlight in the branch's annual calendar and have covered various themes such as elephants; mountains; forests; oceans and coasts; and human origins.

Recent branch activities include the launch of a very successful Heritage Day Photo Competition in 2018 in partnership with *Grocott's Mail*. The aim of the competition is to inspire photographers to celebrate our natural heritage and connect to their natural surroundings. A number of local organisations and individuals played a key role in supporting this initiative, and amateur photographers were taken out into the environment by local experts to hone their photographic skills. These outings included a 'biobash' in the local botanical garden and a game drive in the Amakhala Game Reserve.

Plans are already in place to create opportunities for amateur photographers to participate in this year's competition. The recently launched 'Makana Plastic Action Group' [MPAG], a diverse group of people aiming to curb the usage of single-use plastics, is a sub-committee of the Grahamstown Branch. The group will use this year's SciFest Africa Festival as a platform to train people to create eco-bricks by filling two-litre

plastic bottles with single-use plastics. In February MPAG hosted Hayley McLellan of the Two Oceans Aquarium, sponsored by SPAR EC, to conduct talks on the problems of single-use plastics at a number of schools in Grahamstown.

In addition to the two branches, four Friends groups are active in the Eastern Cape, each of which has taken on the stewardship of local protected areas, all within easy striking distance from Port Elizabeth: the Friends of the Baviaanskloof Wilderness Area (FOBWA), Friends of Van Stadens Wildflower Reserve (FOVS), Friends of Groendal (FROG) and Friends of St Francis

(FOSTER). All are active whilst FOSTER and FOVS are highly effective. Last year WESSA Eastern Cape supported FOSTER and FOVS financially after the devastating fires that occurred in the region. On the east coast, the Haga Haga Conservancy has been working since 1995 to conserve their marine and terrestrial flora and fauna.

In 2017, the Region, and more specifically the Algoa Bay Branch, undertook to participate in the pilot phase of WESSA's new eco-label, the Green Coast Award. Green Coast is all about the sustainable management of sensitive coastal environments – non-urban, wild spaces with minimal infrastructure. The label complements the international Blue Flag award, which assures a world-class experience at urban swimming beaches and has been operational in SA for many years.

One of the identified pilot sites is the Cape Recife Conservancy in Port Elizabeth. In addition to the Conservancy, several of the Algoa Bay Branch's partners support this exciting initiative: SANCCOB (the seabird rescue and rehabilitation centre located in the conservancy), the Pine Lodge Resort, Birdlife Eastern Cape and Nelson Mandela University. However, municipal officials, who are key partners in the project, are still resisting adoption of the Green Coast award and progress has stalled.

A key project run by the Eastern Cape Region in 2018 was the appointment of a 'Youth Coordinator'. We awarded the contract to Ziyanda Mpati for six months and extended it for a further six months. The key objective was to create links with all environmental groups in Port Elizabeth, especially





*Friends of Baviaanskloof on a hike in the Bergplaas area. Hikers are walking on the 120 million year old African Land Surface where Mountain Zebra were unsuccessfully reintroduced*

amongst the youth. Contacts made by Ziyanda showed that there are several organisations working in the environmental field not previously on WESSA's radar. It was decided that WESSA needs to facilitate better networking amongst these organisations and the Algoa Bay Branch is seeking to strengthen an existing environmental forum run by the Nelson Mandela Bay Municipality. Ziyanda is now working on a training coordinator contract for WESSA in Durban.

Last year, the Region was proud to host WESSA's AGM at the Pine Lodge Resort, Cape Recife, in Port

Elizabeth in September, with the theme being WESSA membership's 'Local initiatives for the environment' ('Life'). The day of the AGM coincided with International Coastal Cleanup Day and many of the delegates got up early and collected about a dozen bags of refuse from the beach adjoining the Pine Lodge Resort.

In line with 'Life' Dr Andrew Muir, CEO of the Port Elizabeth-based Wilderness Foundation was the keynote speaker at the AGM. Dr Muir's international exposure and standing, knowledge of environmental

concerns worldwide and environmental wisdom resulted in an amazing talk. He noted that in the greater Nelson Mandela Bay five of the seven major biomes are represented, which is unique internationally. The Region used the opportunity to also showcase some of the inspiring work done by our members and by local partners. Next time that our Region hosts the AGM, we hope to be able to include local initiatives beyond the activities of Grahamstown and Nelson Mandela Bay that are more representative of the entire Eastern Cape. Watch this space!

**Mervyn Brouard**  
EC Regional Committee  
082 875 4210  
mpb@telkomsa.net  
**Jenny Gon**  
Regional Representative  
079 038 6809  
j-gon@intekom.co.za



*The PVC pipe version of the floating wetland*

## The Baynespruit floating wetlands: a modest experiment or a **TURNING POINT IN WATER MANAGEMENT?**

Unlike Cape Town, where water quantity became a serious issue, the water problems in KwaZulu-Natal are much more related to water quality. Here, resulting from ongoing nutrient loading, which is caused by run-off from commercial agriculture and below-standard sewerage infrastructure and waste water treatment, our rivers are gradually turning green. As happened in Pretoria, when the Hartbeespoort Dam could no longer be used for human consumption, our KZN rivers and dams are moving in the same direction! Already Inanda dam, a large reservoir near Durban, is showing high levels of eutrophication and the long-term view for Midmar and Albert Falls does not look good.

Jim Taylor, Esmeralda Ramburran, Matt Janks and Megan Grewcock

The Msunduzi Municipality, in an innovative effort to address the causes of river pollution through nutrient loading, is experimenting with a modest, yet dynamic project, in water quality. It is a well-known fact that plants are able to absorb the nutrients, or food, which is turning our rivers green, so as to build their body mass.

Scientists call this the plant's biomass. In addition, the presence of plant matter provides an environment that is able to support bacteria, which are able to convert liquid nutrients such as nitrogen, into gasses, and return these to the atmosphere.

The dynamic efforts by Msunduzi Municipality, in constructing two tiny floating islands on wetlands in the Baynespruit did not pass unnoticed by all who care about the future viability of our rivers and dams. As is the case in New Zealand, where intensive agriculture and a well-developed dairy industry, is threatening the future well-being of the rivers, South Africa too, is at risk. In New Zealand, floating wetlands and islands are often used to mitigate the nutrient build-up.

The floating islands were constructed by GroundTruth in the Baynespruit, one of KZN's most polluted rivers. Essentially the project is a modest pilot study, an attempt at addressing the causes of the problems with water supply in KwaZulu-Natal. The floating structure provides support and buoyancy for selected plant species, which extend their roots into the water in order to access nutrients for growth. The fact that they are too small to have any large-scale effect is far outweighed by the fact that they are

a turning point in our stream and river management.

In this regard they are beginning to address the cause of the problem not the symptoms. The floating island concept is also using nature, a free resource, to help us solve the problems our human actions are creating. Another feature of the floating wetlands is that they can be constructed, maintained and, where appropriate, harvested by local communities!

Unfortunately for this initiative, a severe thunderstorm occurred on 18 December 2018. This storm had devastating impacts on the floating wetland systems. Although tethered with steel cables to the banks, the storm turned the tiny Baynespruit, which normally flows as a trickle, into a raging torrent that washed the two islands away! Our only consolation is that the plants we planted on the Islands may well have taken root along the banks further downstream, and that we need to learn better methods of tethering islands. Our little experiment is bearing fruit in unusual and unexpected ways!

Rather than seeing the floating islands as a solution (because indeed they were far too small to have any marked effect) we should see them as a turning point in our water management armoury. This is what makes them so special, because at last we are beginning to understand, and do something about the root causes of the serious water management issues KZN is facing.



*The bamboo floating wetland design installed in the Baynespruit River*

**Dr Jim Taylor**  
 Director: Environmental Education WESSA  
[www.wessa.org.za](http://www.wessa.org.za)



## The incredible WHITE MILKWOOD

Eugene Moll

Members of the family Sapotaceae are easily recognisable by having simple, alternate leaves with entire margins that often have a thin, translucent edge. The leaves can be crowded towards the apex of twigs in some species like the Lowveld Milkberry, and these are generally glossy with young foliage often brownish and even orange. All species exude a slightly milky latex when leaves are pulled off twigs (especially when young and not water-stressed), and they lack the obvious stipular scar of the figs. Their thinly fleshy fruits ripen to orange, red or blackish-purple, and all are edible as far as I know.

The White Milkwood *Sideroxylon inerme*, like most of the 'milkwoods', belongs to the family Sapotaceae that globally has ~800 species, mostly tropical and subtropical, and most of these species are trees and shrubs, with 22 species here in South Africa.

Examples are the Coast Red-milkwood *Mimusops obovata*, the 'Stamvrug Milkplum' *Englerophytum magalimontanum* (previously known as *Bequaertiodendron magalimontanum*), and the Giant Fluted Forest-milkwood *Chrysophyllum viridifolium*.

The fruits of some of these milkwood plants are rather delicious, such as those of the Silver-leaved Milkplum *Englerophytum natalense*, if you can get to them before the birds and the monkeys!

The few to many seeds have smooth, brownish, shiny coats. Generally, the flowers are clustered towards the twig apex and are small and yellowish, but in some species, they can be larger, such as in the Moepel Red-milkwood *Mimusops obovata*.

My reason for choosing *Sideroxylon* this time is not only because it has a wide distribution and should be well-known (because it occurs in those areas of South Africa that are well populated - mostly limited to coastal forested or once-wooded areas inland, from Langebaan on the West Coast all the way into Mozambique).

What is very interesting for me is that it also occurs in the Lowveld and into southern Mozambique and Zimbabwe; often on termitaria, but also because three individual trees have such great historical importance that they are proclaimed National Monuments!



*Mimusops obovata*

These are the 'Treaty Tree' in Woodstock, Cape Town, the 'Post Office Tree' in Mossel Bay, and the 'Fingo Milkwood Tree' close to Peddie in the Eastern Cape. For more interesting information about these specific trees, please 'Google' them on the Internet.

An additional point to note is that the *Sideroxylon* group of trees is specially protected in South Africa (I understand this for the Cape Peninsula where fringing, closed groves were decimated by the early colonialists and because of their historical significance. However, in some parts they are common and not more threatened than other tree species!).

Today *Sideroxylon inerme* is mostly a small tree with a heavy, very dark green foliage that can form a nice hemispherical canopy that when undisturbed reaches down to the ground. This often forms a nice refuge for small mammals and, in urban areas, even a place enjoyed by homeless people! It can grow to a small or medium sized tree, some 4-7m high, and is tolerant of windy situations, even with a heavy salt-load close to the coast. Often trees can be in small groves, making them ideal places for fishermen to camp. Isolated individuals are also common; such as on the Agulhas plain south, east and west of Bredasdorp (possibly on 'heuweltjies').

Because of their growth form and tolerance to salty

*Mimusops obovata* ripe fruit orange to red like most in the family





winds, *Sideroxylon* can make an excellent hedge or barrier.

Reasons given for not planting them is that they are slow-growing, (but that is not strictly speaking true, because I have seen them grow to 3m in 5 years, when properly planted and looked after), and that special permission must be obtained to prune them because of their legal status (I would argue that planted, barrier trees can surely be managed!), and finally that when they make the barrier the area could attract undesirable people.

For those of you who know that 'smell' that wafts into your car when passing through George / Wilderness towards Knysna on the N2, the one that some find unpleasant, being a mixture of 'sour-and-sweetness' - that is from the flowers of *Sideroxylon*, that can be present for much of the year (but peak flower is in early summer and also rain dependent). When produced in masses, the flowers attract many insects, particularly a species of fly that I mistook for honey bees, the hover flies, family Syrphidae.



*Sideroxylon* flowers are held tight to the twigs



*Manilkara mochisia* showing clustered leaf arrangement

**Prof Eugene Moll**  
Department of Biodiversity and Conservation Biology  
University of the Western Cape  
emoll@telkomsa.net

## Cooperative agreement with KNP AND PARTNERS

**Working and living in the Kruger National Park was such a privilege; every day one looked forward to new adventures and helping to conserve what Stevenson Hamilton, the first Warden of the KNP called his “Cinderella in the process of becoming a Princess”. As a researcher, wilderness trails ranger and senior section ranger, one’s days were so focussed on what one was doing daily and knowing that you were in one of the most iconic national parks in the world. One did not have much time to think of what was happening outside of the borders of the KNP.**

Article and photos: Bryan Havemann

As KNP employees, we almost felt that we were in a separate world to those around us, and we would enjoy the utopia of our closed, conservation republic. The danger of this ‘island conservation’ mentality, and using fortress tactics to oppose those outside the borders, was highlighted when I started engaging with the communities outside the park, in specialised forums that had been set up to open dialogue. It was through this close engagement that I first realised that we need to think of the bigger picture.

The millions living on the borders of the KNP, many of whom had been displaced by the establishment of the park, needed to be part of the plans of the future. Africa as a continent, was also reeling under the intense poaching pressure on many of its iconic species, and the bush-meat trade was thriving where anything that moved would be considered fair game or fast food.

It was against this back drop that landscape conservation was a way to unite countries in Africa and bring about the changes that would not only be positive for biodiversity conservation *per se*, but also give tangible, sustainable benefits to the communities living in and around protected areas. African Parks and the Peace Parks Foundation were two private NGOs that had already recognised the need for thinking outside the box, and were venturing into the African continent, setting up private/public/partnerships with governments where protected areas were in dire straits and desperately in need of help.

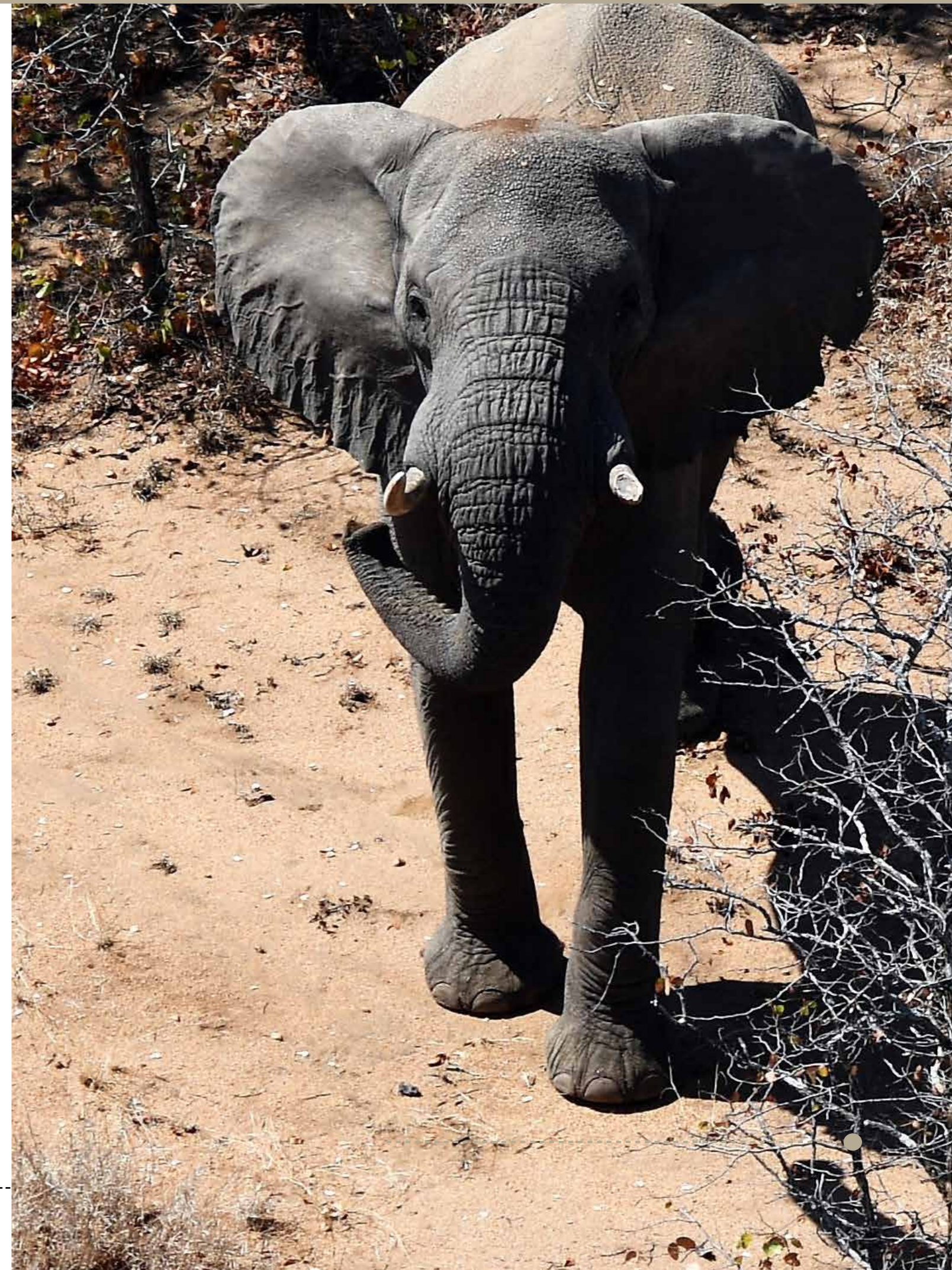
In 2002, President Joachim Chissano of Mozambique, President Thabo Mbeki of South Africa and President Robert Mugabe of Zimbabwe signed an International Treaty for the establishment of the Great Limpopo Transfrontier Park (GLTP) in Xai-Xai, Mozambique. This allowed for the formal proclamation of the GLTP and provided a platform

for the future development and implementation of the Great Limpopo Transfrontier Conservation Area (GLTFCA), which included various land uses around the core Protected Areas, varying from communal areas to private reserves.

Transfrontier Parks (TFPs) and Transfrontier Conservation Area (TFCAs) are established when the authorities responsible for all conservation areas, which border on one another across international boundaries, agree to manage those areas as one integrated unit. These areas may include ecological corridors, private game reserves, communal natural resource management areas and hunting concession areas. The mission is to remove all human barriers within the Transfrontier Park or Transfrontier Conservation Area so that animals can roam freely within the local ecosystem.

The purpose of these parks is to employ conservation as a land-use option to the benefit of local people. This initiative constitutes some of the most exciting and ambitious conservation projects in the world today. These projects aim to establish large areas for conservation by integrating vast landscapes and re-connecting ecological systems. The benefits to local communities are achieved through the establishment of cross-border tourism and socio-economic development programs, while the projects in their entirety promote peace and stability in the region.

SANParks through the Kruger National Park has long realised the importance of expanding the Protected Area network and has used this international treaty as the foundation to turn this dream into a reality. South Africa has an obligation through international commitments to expand its protected area footprint in line with international standards. The Associated Private Nature Reserves (APNR), made up of the Umbabat, Klaserie, Balule, Timbavati and Thornybush



private nature reserves, adjoining the KNP on the western side, are now part of this vast open system. In the early 1990s there were still fences between the APNR and the KNP, but through intense negotiations between the private sector and the government departments, these fences were dropped, allowing for the free movement of wildlife.

During that time there was a loose arrangement and meagre documentation that guided the cross-border partnership. Through the National Environmental Management Protected Areas Act (NEMPAA) No. 57 of 2003, there needed to be regularisation, with certain criteria a prerequisite for a more comprehensive agreement that would foster cooperation and collaboration between the public and private entities and set a clear plan for future management and expansion. Part of what is needed is for the land to be declared a protected area, title deeds need to be endorsed, a management authority needs to be appointed and management plans need to be approved. As per the NEMPAA requirements, this all needs to be approved by the provincial MEC within set time frames after the cooperative agreement has been signed.

After many years of hard work and stakeholder engagements, history was made on 5 December 2018 in Skukuza, KNP where the cooperative agreement was signed between the KNP and the neighbours in the Greater Kruger Area. This was truly a landmark day in the history of the lowveld, and one which would have made those early pioneers very proud of what has been achieved. The cooperative agreement vision of expanding Greater Kruger into the Great Limpopo Transfrontier Conservation Area for resilient ecosystems and communities was being realised.

The purpose of this cooperative agreement is to enable an integrated development approach that establishes collaborative and cooperative partnerships amongst the parties. The cooperative agreement sets out how the Greater Kruger Conservation Area Parties will co-operate to facilitate the successful implementation of the GLTFCA Vision. The focus of this will be to engender cooperation in managing landscape-level ecological issues, unlocking sustainable benefits, growing resilient and responsible economic development, and promoting compatible land use practices within the GLTFCA. The cooperation agreement provides the basis for norms and standards, and best practice guidelines, which are operationalised through over-arching management frameworks, protocols and standard operating procedures.

Greg Martindale, the Director of Conservation Outcomes, summed up as follows: “The cooperative agreement is essential to ensure a uniform framework for the protection, management and socio-economic beneficiation of the open system of the GLTP. It will

address several current and anticipated risks that the open system faces. Importantly, it will ensure that landowners within the open system are able to continue to enjoy the current use of the land in perpetuity, creating a legacy for their families and the region in general. It will address key risks and unlock significant opportunities and benefits for landowners, management authorities and communities living within the GLTFCA”.

The continent of Africa is under threat from a fast-growing human population that will need more and more habitat for this expansion. Having protected areas like the GLTFCA where wildlife and man can live in harmony, and where there is a mutually beneficial relationship, will secure economic growth and ecological viability. The ecosystem services that flow from protected areas that are carefully managed, allowing the natural processes to provide benefits to all, cannot be measured in monetary terms alone, although this is substantial. One of the values that can be singled out is the ecological value, which allows ecosystems to function naturally with minimum anthropogenic input. Things like biodiversity corridors become essential for the free movement of the wildlife, especially in areas of human habitation.

Another value is the aesthetic value which helps to re-charge our collective souls when we spend quality time in a pristine protected area. Beautiful scenery, spectacular wildlife viewing, and sunsets and sunrises that take your breath away, all help to enhance the aesthetic value. There is recreational value, which can be in the form of a wilderness walking trail, game drive in an open vehicle, fishing or even sustainable utilisation of wildlife by ethical hunting practices. This has been practiced since time immemorial, and if it is controlled and managed then this recreational benefit is a key component to the success of the open area.

The spiritual value of being in a wild area is one where you appreciate creation, and this helps to foster humility in most people, when considering the bigger picture and where we fit in the greater scheme of things. The small but important part we play as individuals needs careful consideration and comes with immense responsibility on how we wield our collective powers. Humility, in the spiritual realm, is seen as the greatest strength of all. The economic value is one which needs to be carefully considered but not at the expense of the other values. Some things are priceless and natural, fully functioning ecosystems within a protected area need to be sacrosanct.

Wise use of these resources can provide economic sustainability through job creation, resource use, various tourism ventures etc. The cultural value of these areas must also be considered and protected. Just looking at the plethora of San Rock art, burial

sites of local communities and cultural ceremonies that take place in these wild areas, also highlights the importance of this value. Thinking in terms of global climate change, the importance of oxygen generation and carbon sinks that these vast protected areas have, has local and international benefits.

One of the biggest threats we are facing in southern Africa and possibly the continent is the notion of short-term gain at any cost. There is a feeling amongst some that if I don't exploit the environment

This generation cannot afford to allow the rhino to go extinct, after bringing it back from the brink of extinction less than 60 years ago. A collective security foundation which is called the Greater Kruger Environmental Protection Foundation (GKEPF) has all the stakeholders as members and this is just a small way in which the members can make a big difference. Shared intelligence, joint operations and shared resources will help focus efforts in defeating a common enemy. It is imperative that the governments



first then my neighbour will, so let me get out what I can before somebody else does. A prime example of this is the rhino poaching scourge which has become an international crisis and is being manipulated by crime syndicates the world over for monetary gain alongside human trafficking, drug trade, gun running and the like. The Greater Kruger Area has most of the world's black and white rhino population under its protection and through this agreement that has been signed, a collective and more effective counter to the poaching can be formulated.

of South Africa, Zimbabwe and Mozambique work together to fight this threat. Elephant poaching for ivory is on the rise and despite having a very healthy elephant population across the Greater Kruger Area this also needs to be curbed. Other countries in Africa have lost up to 75% of their elephant populations.

Mining for minerals and the chopping down of hardwood forests also rank very high up on activities that can destroy a natural area in a very short time. The Greater Kruger Area that extends into the GLTFCA across countries should be untouchable with regards to mining and logging activities. All three countries



have strong environmental legislation that prevents this type of exploitation; however the political will must be there to enforce it. Corruption needs to be fought at all levels, not only at ground level with the local communities but all the way through the field rangers and judicial system right to the top structures of the political ruling parties.

Some of the overarching objectives of the GLTFCA and all the partners working together that signed the cooperative agreement are to foster trans-national collaboration and cooperation among all the Parties which will facilitate effective ecosystem management in the area comprising the GLTFCA:

- To promote alliances in the management of biological natural resources by encouraging social, economic and other partnerships among the entities, including the private sector, local communities and non-governmental organisations;
- To enhance ecosystem integrity and natural ecological processes by harmonising environmental management procedures across reserve and international boundaries and striving to remove artificial barriers impeding the natural movement of wildlife;
- To facilitate the establishment and maintenance of a sustainable sub-regional economic base through appropriate development frameworks, strategies and work plans;
- To develop integrated ecotourism in the GLTFCA including trans-boundary eco-tourism as a means of fostering regional socio-economic development;
- To establish mechanisms to facilitate the exchange of technical, scientific and legal information for the joint management of the ecosystem;
- To support the development of community-based biodiversity management initiatives and improve benefit flows to people in and around protected areas; and
- To recommend sustainable and responsible resource use, e.g. animal off-takes, support and promote compatible activities within and adjacent to protected areas.

This is a very ambitious undertaking, and currently where doom and gloom is the order of the day in the international, social and broader media platforms, we are all super-excited to be part of such a bold and life-changing initiative. The broader dream in the region has been in the pipeline since the signing of the treaty; however, the process began in earnest more than three years ago and after extensive stakeholder engagement and consultation the final version was agreed to and signed on 5 December 2018 in Skukuza in the KNP, by all the participating entities. The effects of this collective step taken by brave men and woman will be felt in perpetuity. Future generations will

celebrate the fact that there were such thoughtful visionaries from all walks of life that took the future of our planet seriously and secured the GLTFCA in this responsible manner.

One of the biggest dangers are the radical groups that are seeking to undermine the process in any way they can, to push through their own agendas by using emotional blackmail. Animal activists use the anti-hunting banner to try and stop sustainable utilisation practices. The hunting protocol that has been developed over the years is a protocol that we all can be proud of and has all the necessary checks and balances in place to ensure that there is strict compliance. Others might push a mining agenda and say that the coking coal in the northern part of the KNP needs to be mined.

The Protected Area status is so important to prevent exploitation and these natural areas have the necessary legislation that will keep them in custodianship, not only on a national level but also at an international level through the treaty that was signed. Indiscriminate agricultural practices can also change natural areas and the slash and burn techniques practiced across Africa for charcoal production and then short-term monoculture crop production in those cleared areas is not sustainable.

Natural protected areas need to get the status they deserve, and governments need to recognise that the ecosystem services they provide are priceless and irreplaceable. Change is something that is resisted when it takes people out of their comfort zones, but we are living in times where our generation is deciding the future well-being of our planet. The signing of this cooperative agreement that came about out of necessity in being compliant with national environmental legislation is a very positive step in addressing the ecological and economic challenges of the Greater Kruger Area.

Working smarter collectively on a landscape scale makes so much more sense than working by yourself on a postage stamp-size farm in relation to the bigger picture. It is the bigger picture mentality that will bring viable, sustainable solutions for the region and for the African continent. Rather than be left behind let us get on the bus and be part of the solution and not exacerbate the problem.

**Bryan Havemann**  
Warden of the Umbabat Private Nature Reserve  
warden@umbabat.com



## Gardening for wildlife: HABITAT FOR BREEDING BULLFROGS

**For those who have not visited Random Harvest before, we're an interesting place to be. The busy nucleus of the business is a hive of activity most days, with a tea garden surrounded by our retail indigenous plant nursery; the office and kitchen are situated to one side. Above and below this part of the property, are our wholesale and propagation sections of the business.**

Heather Balcomb

The restored grassland, in which the dam is nestled, is in the furthest corner of the expansive property, with no walls but only wire fences separating the property from neighbouring land. Wildlife has always been free to come and go as it pleases, and in recent years, more has arrived than has left.

I am not too sure when the Giant Bullfrogs appeared on the scene, but each year there seem to be more of them visiting our little dam. We had so much fun watching these amazing creatures this summer, that I decided to deviate from the regular articles we submit to share some of the pictures and relay our experience. Outlined below, are various ways in which different garden wildlife could make use of shelter provided for them.

Although Giant or Highveld Bullfrogs *Pyxicephalus adspersus* are not listed as endangered, they are in the category of 'Near-threatened'. Development, particularly in Gauteng, has shrunk their natural habitat, and thus had a negative effect on their numbers. In some areas, whole populations have disappeared. You can imagine our delight to have them breeding at Random Harvest Nursery!

In order to breed, bullfrogs need shallow pans or bodies of water with a shallow edge. Our dam provides just such a body of water. The Giant Bullfrogs aestivate over winter, only coming out to breed and feed themselves up during the warmer, wetter summer months. For bullfrogs to breed, over 50mm of rain must have fallen.

This summer, I thought the rain had come a little too late for the Giant Bullfrog to come out of their burrows in the grassland to breed. Boy was I ever wrong! There were more than ever before, and I can only think that they have moved in due to development in the surrounding area.

A few weeks ago, Jeff and I went down to check the water level of the dam. I am always excited about this as we have made furrows to harvest rainwater that

runs off the roofs in the nursery and from the water seeping out between the lines of growing plants. I am proud that we made these furrows as they make sure no water is wasted and help to prevent erosion when a large amount of water washes off the paving.

Imagine our excitement when we saw about eight Giant Bullfrogs in the dam with all the territorial drama of breeding associated with this. The males are very aggressive, blowing themselves up to look a lot bigger than they are as they fight for the top spot. This went on for about five days. Eventually this huge dominant male got the job of looking after the tadpoles. The eggs hatched within a few days. The tadpoles were so tiny that I didn't think they could be bullfrog tadpoles, but I was wrong.

These little tadpoles grew at a phenomenal rate under the watchful eye of the huge male. I was so worried that the birds and other predators would make a feast of the tadpoles. I needn't have worried as the male is so aggressive that they kept a respectful distance. Apparently, he is not just the chief protector, but also makes sure that water in the shallows is channelled to maintain a constant temperature and depth to ensure that the eggs and tadpoles have an optimal growing environment. He does this by using his back legs to create channels for better water flow.

Abby, my little dog, is constantly by my side, and, was fascinated by these visitors to the dam. When she put her nose near the tadpoles for a closer look and sniff, the fearless babysitting male launched himself at her, legs spread wide to flash his alarmingly bright yellow belly. Poor Abby nearly had a heart attack and kept her distance from then on!

Jeff and I visited the dam at least three times a day to make sure that the tadpoles were safe, but we needn't have worried, they had a good father with a fiercely watchful eye. It was quite amazing observing the transformation. One could see the tadpoles beginning to look like mini bullfrogs whilst still carrying their egg sac.



*Yolam, the baby bullfrog protector*



*The dominant male bullfrog*



*Tadpoles growing apace*



*A miniature bullfrog*

I didn't think we would be lucky enough to see the babies leaving the dam. We nearly missed them as they dispersed into the long veld grass around the dam. Fortunately, Jeff's keen eye meant that we were lucky enough to see the migration. And...oh my word! They were the cutest, perfect little miniature bullfrogs!

It took two days for the young bullfrogs to leave the water, but they remained in the refuge of the grass around the dam. The first day 'Big Daddy' was there to protect them, and then, with his hard work over, he left. No sooner had he left than the herons arrived to feast on the babies. This I just couldn't allow and had to appoint the 'Protector of the Bullfrogs', Yolam, who will be spending his days there, keeping the herons at bay until the babies have dispersed further afield.

Believe it or not, this whole process took only eight days.

I am sure we will see the odd Highveld Bullfrog around the grassland and in the nursery, but we'll be waiting in anticipation for next summer's entertainment, when they once again take over the Random Harvest Dam. We are fortunate to have the space at Random Harvest for a dam and for the surrounding grassland. I must emphasise that not all habitat is equal, and it must be maintained in urban and peri-urban areas. Weeding is an ongoing job here, and with the rate of alien plant invasion, it is all we can do to keep the grassland weed-free. But the

hard work pays off. Each year the grassland seems to improve in condition, and new indigenous grassland plant species appear. It attracts a great number of bird species too, and although some interference is necessary (as with protecting our precious 'baby' Giant Bullfrogs), nature is left to create its own balance in this special part of Random Harvest.

We feature interesting wildlife and indigenous plants at Random Harvest in our monthly e-newsletter. This and an archive of all previous newsletters is available on our website at [www.randomharvest.co.za](http://www.randomharvest.co.za) and can also be subscribed to, and received, by email.

If you would like to learn more about the Giant Bullfrog, the Endangered Wildlife Trust has an interesting e-booklet on these fascinating creatures. This is the link: <https://www.ewt.org.za/TAP/pdf/Bullfrog%20booklet.pdf>.

**Heather Balcomb**  
Random Harvest  
[www.rh.co.za](http://www.rh.co.za)

# Water, birds, and biodiversity VITAL ELEMENTS OF EDUCATION

John Fincham, Skhumbuzo Mbewu,  
and Jo Hobbs

**Given the reality of the water crisis in the Western Cape (WC), especially in the City of Cape Town and its satellite towns, a unique opportunity exists to use the combination of the Paarl Bird Sanctuary and the Drakenstein Waste Water Treatment Works (PBS/WWTW) for education about water and related facts. Severe drought is not the only reason for the shortage of potable water. It is likely that the water requirements of the burgeoning human population of the province, together with the need to use water to irrigate food crops, now exceed the water resources of the WC, despite the storage created in dams.**

An associated fact is that in the WC a large proportion of employed people work in agriculture, both directly and indirectly. So any cut in water for irrigation would increase unemployment and intensify poverty, which are already huge problems. The overall predicament has countrywide, and even global implications, emphasising the need for water related education and research.

The PBS/WWTW complex is situated on the east bank of the Berg River, about 30 km from the source, which is in the mountains above Franschhoek. This riverside location creates the responsibility to constantly ensure good water quality for downstream use by people and agriculture. It also provides an exceptional opportunity for environmental and health education, from school children to students at technicians and universities. For schools in particular, the venue can be an open-air classroom that excites and holds the attention of scholars, thereby increasing the educational impact of the available resources. Opportunities for research projects, tourism and recreation are also substantial. By contrast, the processed water from the Strandfontein WWTW at Cape Town currently flows directly into the sea without any re-use by people.

Some of the history of PBS has been described (Cohen *et al.*, 2006); Harebottle *et al.*, 2008). The seven existing pans form a substantial artificial wetland covering approximately 50 hectares. In recent years the waste water treatment process has been modernised, and final water quality is monitored in an on-site laboratory. The return of water to the river throughout



*Paarl Bird Sanctuary is bordered by the Berg River and vineyards to the west, with industrial and residential areas to the east. Pans A–D form an artificial wetland that attracts prolific birdlife, and from which treated waste water feeds back to the river for reuse downstream*

the year contributes to a sustained flow for human and other uses, in towns and on farms downstream. In the dry summer months the proportion of treated water in the flow volume of the river increases.

In addition to the exceptional educational potential of the process of treating waste water for reuse, especially by people, the PBS artificial wetland and the adjacent Berg River, create an important opportunity for learning about biodiversity, especially as regards birds and invasive vegetation on the river banks.

#### Bird counts at PBS

Monthly counts of water-associated birds have been done for 24 years, and no count has been missed. Data for the first ten years of counts has been analysed and published (Harebottle *et al.*, 2008). It was concluded that PBS was second only to Strandfontein WWTW (now known as the Birding Section of the False Bay Nature

Reserve) for conservation of water-associated birds in the Cape Town area. Furthermore, PBS supports 11 universally and regionally important species for monitoring numbers and migrations. A recommendation was that PBS qualifies globally and regionally as an important Bird Area and a Ramsar Site.

The Grey-headed Gull is a sought-after bird that is numerous and approachable at PBS. The list of species seen regularly is substantial. Exciting vagrants that are occasionally present include Squacco Heron, African Jacana, Lesser Flamingo (nomadic), Little Bittern, and Goliath Heron.

#### Recent problems at PBS

It is on record that in 2004 thousands of local and international birders visited PBS, but by 2017 the number of visitors had dwindled to a few at weekends only, and under security cover, because of real or attempted robberies. The adverse publicity from this criminal activity has been disseminated widely. Moreover, facilities have been repeatedly vandalised. The Yvonne Weiss bird lookout platform is a concrete and brick structure that provides high-level views over five pans. Below the platform there is an undercover area that can be used for audiovisual aids like videos, slide projection, and poster displays. It has been severely vandalised twice. To stop further vandalism, it is now surrounded by high security fencing topped by razor wire; strong locked gates; pepper spray in the toilets that activates automatically at night; 24 hr CCTV camera surveillance; and flood lighting at night. It is currently only open to visitors over weekends because of the threat of vandalism and robberies.



*The Yvonne Weiss bird lookout platform is a useful part of the outdoor classroom because the upper deck overlooks five pans. Here the waste water treatment process is being explained to children from Dalweide Primary School*



*Children watching a video showing microscopic, commensal organisms that occur normally in clean water. They are in the undercover part of the Yvonne Weiss bird lookout facility*



*A Grey-headed Gull sitting on nestlings. These gulls are numerous at PBS and allow a close approach, which facilitates photography*

'Donated by the Cape Bird Club' was the inscription on a plaque in the Rita Meyer/Sand Island bird hide, which was built by Paarl Boy Scouts. This hide, and three others, have been destroyed by vandals, were rebuilt, and destroyed again. To counter crime, PBS is now only open at weekends when security officials are

key information back to the communities they serve. School principals arranged meetings with all the teachers at schools in order for the project to be described. There is a time gap at 14:00 when teachers can attend meetings. Meetings took place at all the schools serving Mbekweni and Groenheuwel suburbs of



*Human population pressure is high along the eastern side of PBS*

in attendance. Birders are instructed to stay in their cars and use them as hides by parking at cleared vantage points. Since these arrangements came into force visitor numbers have started to increase slowly.

**Human population pressure**

There is an ongoing increase in the population in the Mbekweni and Groenheuwel suburbs of Paarl along the eastern side of PBS. The provision of housing has been overwhelmed, so that many people are living in shacks under conditions of poverty, with a high rate of unemployment.

**Our Project**

**Informing communities through schools**

It was proposed that if communities in Paarl, and particularly those adjacent to PBS, were informed about the potential of the PBS/WWTW complex for environmental and health education, as well as for tourism, recreation, research and job creation, then they would come to realise that these assets needed to be safeguarded and used wisely for their own benefit. The principle that local community support is essential for recreational and wildlife areas, and National Parks, is widely known and accepted.

The Drakenstein Municipality, the local government authority for the area, requested a business plan as a condition for authorisation of the project. A document was accordingly prepared, submitted and accepted by the top municipal management. It proposed to work through schools as an effective way to start to convey

| <b>Table 1. School meetings, dates and numbers attending</b><br>(PS = Primary School. HS = High School) |                      |                    |
|---|----------------------|--------------------|
| School  | Date                 | Teacher attendance |
| Langabuya PS  | 1/3/2016             | 21                 |
| Imboniselo PS   | 18/4/2016            | 30                 |
| Mbekweni PS   | 4/5/2016             | 32                 |
| Desmond Tutu HS   | 5/5/2016             | 32                 |
| Dalweide PS   | 15/8/2016            | 25                 |
| Groenheuwel PS  | 6/10/2016            | 23                 |
| Ihlumelo HS   | 1/3/2016 & 14/9/2017 | 42                 |
| <b>Total teachers</b>   |                      | <b>205</b>         |

Paarl. A total of 205 teachers attended, usually including the principals. Details of the meetings are summarised in Table 1.

**Information presented to teachers at school meetings**

Emphasis was placed on crucial environmental messages conveyed clearly by birds in five ecosystems. In addition, the need to ensure water quality and flow in the Berg River was explained (as specified previously), as well as the problem of invasive, non-indigenous trees along the river banks. Information was presented by means of discussion supported by visual aids. The teachers were advised that practical examples relating to the information presented could be demonstrated at the nearby PBS/WWTW complex, which is an ideal outdoor classroom for environmental and health education. Here are some examples of messages conveyed by

birds, according to ecosystems they utilise, as presented to teachers.

**Terrestrial birds globally:** long distance bird migrants are warning of devastating habitat destruction along flyways that span the earth. The numbers of some of the migrants that reach PBS, such as the Common Sandpiper, and the White-winged Tern, have declined drastically since counts started 23 years ago. Human related pressures are damaging the flyways migrants use in several ways. These include urban sprawl; overgrazing by livestock; destruction of forests and woodlands; agricultural monocultures (crops, forestry and livestock); draining of wetlands; flooding of wetlands by dams; and lethal obstacles in flyways (electricity power lines, wind turbines, fences, roads, and railways). In India, migrating Amur Falcons, which cross the Indian Ocean to reach Africa, are caught in nets for food. In Malta; there is ruthless hunting pressure on migrating birds which is also the case in Cyprus and other Mediterranean countries.

**Oceanic seabirds:** pelagic birds that feed exclusively at sea include albatrosses, penguins, gannets, cormorants, and others. They are in serious trouble because industrialised over-fishing is depriving them of food and killing them as by-catch; and also because we have introduced predators that are killing their chicks on the islands where some of them breed. Ultimately there may be no fish left for birds or people because high-tech, mechanised, industrial fishing, was not part of evolution.

**Birds regionally in southern Africa:** Here the avian messengers of disaster are all the vultures, some large



*The carapaces of 315 small tortoises killed by a pair of Pied Crows to feed four chicks and themselves, in the Karoo. Additional prey must also have been taken. Photo by Nollie Lambrechts*

**Alphabetical list of species mentioned in text with scientific names**

- African Jacana *Actophilornis africanus*
- Amur Falcons *Falco amurensis*
- Bateleur *Terathopus ecaudatus*
- Black Wattle *Acacia mearnsii*
- Black-winged Stilt *Himantopus himantopus*
- Common Sandpiper *Actitis hypoleucos*
- Crowned Eagle *Stephanoaetus coronatus*
- Goliath Heron *Ardea goliath*
- Grey headed Gull *Chroicocephalus cirrocephalus*
- Large Roundworm *Ascaris lumbricoides*
- Lesser Flamingo *Phoeniconaias minor*
- Little Bittern *Ixobrychus minutus*
- Martial Eagle *Polematius bellicosus*
- Secretarybird *Sagittarius serpentarius*
- Southern Masked Weaver *Ploceus velatus*
- Squacco Heron *Ardeola ralloides*
- Tawny Eagle *Aquila rapax*
- White-winged Tern *Chlidonias leucopterus*

eagles such as Martial, Crowned, Bateleur and Tawny, and the Secretarybird. In 2015 they were classified as vulnerable, endangered or critically endangered. In South Africa there are many places named 'Aasvoëlskop/krans', but the vultures are no longer there. The background to this situation is that the region has been carved into seven countries and numerous provinces by politicians, with no consideration of environmental impacts. The biomass of ecologically adapted migratory game, that fed vultures and some eagles, may well have exceeded the biomass of current farm animals.

Seasonal migration routes have been cut by numerous barriers. Some of these are lethal, such as electricity power lines and the veterinary fences in Botswana and Namibia. Absurdly, these fences are a condition for beef importation by the remote European Union. Moreover, there are now extra obstacles in wind turbines, as well as the less intrusive solar energy facilities. The link that follows provides recent information on damage from wind turbines:

<https://www.fin24.com/Economy/wind-farms-can-be-deadly-20171217-2>

**Urban birds locally:** crows in towns are easy to see and can be important scavengers, indicating the presence of litter that they help to clean up. However, with litter there are inevitably rats, mice, fleas, lice and numerous microscopic pathogens in excreta from humans and animals. When there is wanton human defecation on the ground because there are no toilets, children are often infected by helminths, and other intestinal parasites. The illustration of a piece of intestine surgically excised from a three-year old boy, because it was blocked by Large Roundworms, emphasises the risk, and elicited shocked gasps from some teachers.



Clearing of invasive trees from the banks of the Berg River is underway. Indigenous species are being planted to replace the non-indigenous invaders

**Rural birds locally:** Away from towns crows must hunt for food. When they decimate tortoises it is an indication of an impoverished rural environment with an imbalanced biodiversity. The crows have moved into a niche vacated by vultures, eagles and other raptors (as described regionally), and tortoises can be a vulnerable residual prey species. Some local tortoise species are on the verge of extinction (Branch, 2008).

**Water quality & quantity:** Natural wetlands are the source of rivers, into which they filter clean water. They are usually rich in biodiversity, of which birds are a part. Humans take clean water from rivers, emanating from natural wetlands, pollute it seriously (including sewage;



Grade 10 scholars using a scope and binoculars as aids for identifying birds, at PBS. These are important tools for use in outdoor classrooms

other excreta; soaps, detergents and dirt from washing; discharges from hospitals, industry and agriculture), and must then return it to the river because it is needed for use downstream. This situation pertains to the Berg River at Paarl and Wellington. If the water is not cleaned thoroughly, pathogens, toxins and pollutants could be disseminated to communities all the way to Velddrif, at the mouth of the river.

A warning of a dangerous situation is when ducks and other water-associated birds die in numbers due to excessive levels of botulism toxin in algae, snails, maggots, mussels & fish that they eat, especially when water is semi stagnant. Details of the water treatment process are not the main focus on this paper, but were summarised in introductory talks to teachers and



The woven nests of weaver birds are a wonder of nature. Using only his bill, this male Southern Masked Weaver is weaving blades of grass into the nest structure



A nest of the Black-winged Stilt with eggs

**Table 2. Details of educational tours by schools to PBS/WWTW**  
(PS = Primary School. HS = High School)

| Date          | School                | Scholars   | Teachers  |
|---------------|-----------------------|------------|-----------|
| 1/10/2016     | Desmond Mpilo Tutu HS | 42         | 1         |
| 2/10/2016     | Desmond Mpilo Tutu HS | 44         | 1         |
| 22/2/2017     | Groenheuwel PS        | 76         | 1         |
| 23/2/2017     | Groenheuwel PS        | 76         | 2         |
| 24/4/2017     | Langabuya PS Scouts   | 64         | 2         |
| 4/9/2017      | Dalweide PS           | 60         | 2         |
| 6/9/2017      | Dalweide PS           | 60         | 2         |
| 12/9/2017     | Dalweide PS           | 66         | 2         |
| 10/10/2017    | Ihlumelo HS           | 45         | 2         |
| 11/10/2017    | Ihlumelo HS           | 47         | 2         |
| 12/10/2017    | Ihlumelo HS           | 47         | 2         |
| 23/10/2017    | Ihlumelo HS           | 52         | 2         |
| 24/10/2017    | Ihlumelo HS           | 21         | 1         |
| 25/10/2017    | Dalweide PS           | 60         | 1         |
| 26/10/2017    | Dalweide PS           | 30         | 1         |
| <b>Totals</b> | <b>5</b>              | <b>790</b> | <b>24</b> |

scholars. The need to ensure minimal risk of transmitting waterborne diseases and toxicities downstream was emphasised in the preferred language of each tour group. It was confirmed by primary and high school teachers that water purification is an important part of the curricula.

**Invasive riverine trees:** The Berg River and its banks are an ecosystem that is used by birds and a wide range of other organisms. The river banks have been invaded by non-indigenous trees, especially Eucalyptus species and Black Wattle. These trees need so much water to sustain their prolific growth that the hydrology of the river, as

well as the biodiversity of the ecosystem, have both been adversely affected. The river flow has been reduced, and erosion has been enhanced because peak flow pressures on the banks and the bed have changed. Moreover, the unnatural tree cover has compromised many of the indigenous plants and animals associated with the river. A programme is underway to eradicate the invasive trees and restore natural biodiversity.

**School tours**

Following the descriptive introduction to the teachers, they were keen to have scholars undertake educational tours of the PBS/WWTW complex. Accordingly groups from two high schools and three primary schools toured the complex, as detailed in Table 2.

On arrival, each tour group was given a short introductory talk in their preferred language as far as was practical. This helped the children to relax. They were introduced to how we use water, and the necessity for reuse after purification, since available water, sustained by natural wetlands, is limited. A key point was to explain and emphasise biodiversity as being the whole range of interacting, water dependant life forms (animals and plants) in any ecosystem, including humans.

After this, groups were divided so that half were helped with bird identification by experienced birders, working from the Yvonne Weiss bird lookout platform, using binoculars and spotting scopes. Each child was provided with a laminated sheet (for reuse) with photographs in colour of 24 birds that are always present at PBS, printed on both sides. A score card corresponding to the coloured photos, with thumbnail bird images, gave the bird names in four languages: Afrikaans, English, SeSotho and isiXhosa. Completion of the score card created a competitive task for each individual on



| Table 3. Responses from grade 10 scholars to questionnaire (n = 86 scholars) |                       |
|--|-----------------------|
| <b>Paarl Bird Sanctuary (PBS)</b>  |                       |
| Would you like to have bird-related school projects?                         | 87% definitely would. |
| Would you like to visit PBS again soon to learn more about birds?            | 87% definitely would. |
| How much did you enjoy looking at the birds?                                 | 74% replied "A lot."  |
| <b>Waste Water Treatment Works (WWTW)</b>                                    |                       |
| How much did you learn about water purification?                             | 60% replied "A lot."  |
| Will what you learned at the WWTW help with your school work?                | 70% replied "A lot."  |

the day. The use of spotting scopes and binoculars to facilitate identification of different bird species was an exciting experience for the scholars.

The other half of each group went on a guided nature walk along the berm between pans E2 & E3 (see Figure 1). On the walk a wide variety of birds were identified. Nests of the Southern Masked Weaver were demonstrated.

The intricacy and complexity of nest construction by weavers is an important lesson for everyone, and deserves enormous respect. Nests with eggs of the Black-winged Stilt, and the Grey-headed Gull were also shown to the scholars. After about an hour the groups changed around.

### Project Results

Scholars from the high schools in grades 10, 11 & 12 completed questionnaires to evaluate their educational experience from the tour of the PBS/WWTW complex. The analysis in Table 3 (on the following page) shows the percentage responses to specific questions by grade 10 scholars.

### Written comments were submitted by 55 High School scholars. A selection of five of these follow:

"I definitely want to visit again. Outdoors studying is more interesting. I will educate my friends about the wonderful tour we had today. I will tell my peers and family to remove waste from the water because it can seriously damage the WWTW."

"It was quite a mind-blowing experience and I really enjoyed it. I liked the part where we learnt about birds. There was also useful information on water purification."

"I have learned so much from you guys. You are excellent and I hope to see you again, teaching me about birds and how to purify water. Thank you."

"Visiting the WWTW was very exciting and more interesting than being in class to learn what exactly is the purpose and role of natural organisms. I would like to visit this place often."

"I have learned many different things about birds, their behaviour and how they raise their children. It was the most awesome lesson I ever had. I want to learn more about birds."

Only one girl in 790 scholars commented that she was not interested in birds or water purification.

**Evaluation by teachers:** eight Primary School teachers stressed the need for security protection of the PBS/WWTW complex, especially to make it safe for education. Two teachers commented on the importance of community involvement, as follows:

"This is such a valuable part of our environment. So, if we can get more schools to visit the sanctuary, people and the community will become aware of it and learn how to appreciate, respect and conserve our environment."

"The residents of the surrounding area should be informed about the value that PBS holds for tourism, and that new job opportunities can be created. Then they must work together with PBS to fight crime."

A comment specific to education was: "Educational tours/excursions like these expand the learners' frame of reference and make the curriculum more 'alive'. It also teaches them to respect and appreciate our environment, as well as to conserve our animal and plant species."

A teacher at Desmond Mpilo Tutu High School wrote as follows: "I would like to thank you for opening up opportunities to our learners at Desmond Mpilo Tutu. They have learned a lot, and the information gathered will be used on science-related projects. We are looking forward to have more of these awareness programmes and we hope that they can improve environmental awareness in our community and promote a healthy lifestyle. This initiative will strengthen our relationship."

### Recommendations and Discussion

The most important result from this project has been the enthusiasm of the teachers and scholars involved. This thirst for vital knowledge can be contagious. Based on this, it is recommended this report should be circulated for consideration and action to all administrators of education, curriculum planners, and schools in the WC, and possibly throughout South Africa. Education needs to be adjusted as a matter of urgency, in order to communicate the crucial messages about the unsustainable pressure from humanity on the global and local environments that are conveyed so clearly by birds. Wherever there are outdoor classrooms similar to the PBS/WWTW complex, these should be used as they are the most appropriate and effective venues for this essential form of environmental and health education.

A grade 10 girl reinforced this recommendation when she wrote in the evaluation questionnaire: "The



out-of-class lesson is much better because you are taught on what you can see and I would like it to be done every week, just one day a week, so we can understand what we are taught and help us to know how birds are essential in our environment. It gave me an interest to learn more about nature and water."

A different but equally important reaction was from a boy at a different senior school. After he had seen the wide range of bird species in PBS he said that before the tour he had thought that doves were the only birds. This emphasises the ignorance of many urban children about nature as a whole, and the urgent need to move education outdoors as the best way to teach holistically about biodiversity and threats imposed by humanity on the survival of their own species.

The current extreme shortage of potable and irrigation water in the Western Cape, and in much of the rest of South Africa, emphasises the reality of the environmental crisis that exists. The water requirements of the human population of the Western Cape now probably exceed the fresh water resources of the province, despite storage in dams. The water crisis defines the urgency of conservation of the natural wetlands from which our water originates, throughout southern Africa.

An overall conclusion and recommendation is that humanity needs to listen to and act on the clear messages from birds and biodiversity. It is imperative that human population pressure on the environment locally in the WC and universally, must be reduced. A key to achieving this is that the reproductive rate of our species needs to slow down, so that the global human population starts to show negative growth. A start should be through education from entry level to universities. Human demographics as the prime driver of environmental pressures should be the dominant theme throughout education, and across most subjects. For example there are clear mathematical, historical, scientific and geographic aspects to this subject. The top priority of Departments of Human Demographics at universities should be research of human population pressure as the most powerful destructive environmental force globally. However, education alone will not be quick enough to resolve the problem that exists.

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Ilze Fiellies and Cindy Winter.

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### John Fincham

Cape Bird Club member & SABAP2 atlaser, Cape Town South Africa  
fincham04@gmail.com

### Skhumbuzo Mbewu

Tour Guide & SABAP2 atlaser, Cape Town, South Africa

### Jo Hobbs

Cape Bird Club member & SABAP2 atlaser, Cape Town, South Africa



*Three International School Programmes for transformation and education for sustainable development*



**1. WESSA Eco-Schools:** Since 2003, this whole school development programme has helped to mobilise future-oriented action through an eco-committee, audit and implementation plan. The annual awards system has motivated early childhood development centres, primary and secondary schools to engage creatively in activities like food production, recycling, biodiversity stewardship, wise water and energy use and much more. Through teacher training, research and project-based learning, Eco-Schools has improved the quality of education in private and public schools and demonstrated that organically-grown food, sound waste management and exposure to green spaces are linked to human health and well-being.



**2. WESSA YRE (Young Reporters for the Environment):** WESSA embraced YRE to develop young African leaders to pursue a vision of human rights, inclusivity and environmental and social justice. In recent years South African youth have become vociferous socio-economic champions and YRE allows for the inclusion of an ecosystem lens which is essential for long-term strategy. YRE operates on a strong social media and global network allowing for solution-driven, knowledge rich and contextual discourse. Young reporters are mentored by experts in the field to determine bold, smart and sensitive solutions to local environmental issues. This focus on making a positive difference uniquely positions high school learners to hone research and leadership skills and explore careers. YRE encourages self-directed learning essential for success at a tertiary level.



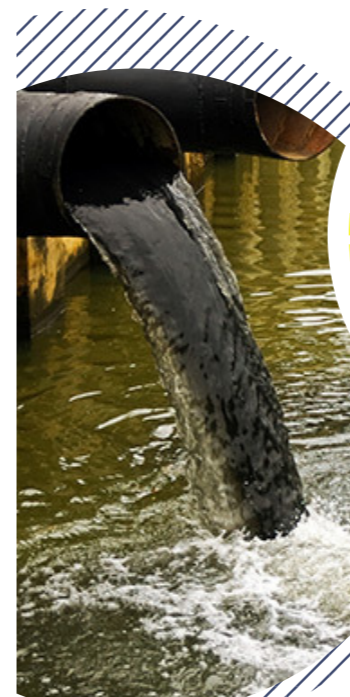
**3. WESSA LEAF (Learning about Forests):** LEAF includes indigenous knowledge systems based on experiential learning of past generations to bring an awareness and appreciation of a holistic African worldview of South African biomes. Through LEAF the shared tenets of modern science and indigenous knowledge, contribute to maintaining the integrity of natural ecosystems. Indigenous knowledge unlocks entrepreneurial opportunities such as woodworking, weaving, use of edible and medicinal plants and farming with earthworms or beneficial insects for food and feed. Learning expeditions allow for rigorous, practical learning through a STEAM approach to unlock learner potential through participation.

Through its three international education programmes, WESSA is promoting innovation in learner-centred development. A combined school that goes from Grade R to 12 would do well to include all three programmes as there are elements that complement each programme and there is a greater opportunity for participation in all phases of the school. While a primary school might migrate between LEAF and Eco-Schools or simultaneously do both, a secondary school might be better suited to pursue YRE which promotes critical thinking and leadership. YRE deepens understanding of the research process through literature surveys and application of knowledge. For teenagers, education must be a journey of adventure, discovery, self-actualisation and learning real-life developmental skills for the workplace. Eco-Schools has many years of accumulated practical wisdom in multidisciplinary education YRE and LEAF allow for adaptation, alteration and transformation of differentiated learning relevant for the range of learners being educated today.



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This is the most widespread longclaw in Africa. Outside of the tropics, it tends to be restricted to warm, low lying or coastal regions. In size and appearance, it has a great similarity to the Eastern and Western Meadowlarks of North America, but our longclaw lacks the singing virtuosity of the Meadowlark and is in an entirely different family of birds.

The Late Willie Froneman

The Yellow-throated Longclaw *Macronyx croceus* (R 728; 'Geelkeelkalkoentjie' in Afrikaans) has an elongated hind-toe claw, from which the 'longclaw' takes its name. The claw averages 21 mm in length and does, of course, serve a function. It enables a longclaw to walk on top of rank grass by straddling several grass blades at once, thus distributing its 45 to 50 gram weight on enough supporting material. The long hind claw is however, something of a hindrance when the bird attempts to perch on a slender twig or branch. The birds are much more at home in and on grass, the ground or other hard surfaces, such as a termite mound, on which they perch to sun themselves when the grass is wet.

Sexes are alike, the female slightly duller in colour. It is a large yellow-breasted longclaw with black streaking below a black breast band, which extends up the side of the neck, encircling a yellow throat. The forehead to nape is a buffy brown colour, with the feather centres darker, giving a streaked effect. The upper parts of the longclaw are a greyish brown, lightly streaked. Wing primaries are dark olive-brown, upper wing coverts dark olive-brown with pale fringes. Chin, throat, malar region, and fore neck are a deep lemon yellow, enclosed by a black necklace. The sides of the upper breast of this species are a creamy yellow, with the lower breast and belly deep lemon yellow. The flanks and undertail coverts of the Yellow Longclaw are yellow-buff. The tail is dark olive-brown with white tips to outer tail feathers. Finally, the upper mandible of the beak is blackish, lower mandible paler, eyes dark brown, and legs and feet pale brown to dull yellow.

The Yellow-throated Longclaw is a common resident in grassland, adjoining freshwater areas, coastal estuaries and lagoons, and also in well-grassed savanna woodland away from water. Their call is a loud, whistled " phooooeet " or series of loud whistles, frequently uttered from a perch or on

## YELLOW-THROATED LONGCLAW



Photographs: Albert Froneman





top of an anthill. This bird also calls in flight.

The Yellow-throated Longclaw is widespread in Africa from Senegal to Kenya discontinuously south to South Africa. In southern Africa, it is found in the moist northern and eastern region of Zimbabwe to central and southern Mozambique. In South Africa, it can be seen in the eastern Limpopo, Mpumalanga, and KwaZulu-Natal stretching down south to East London. In these regions it is a resident with limited dispersal prior to breeding season (which starts as a response to rain), occurring from dry to moist grassland and vlei margins. Sometimes found in short, overgrazed or burnt grassland, but this species prefers medium to tall rank grass in areas with scattered shrubs or trees.

They are usually found in pairs or family groups. This species habitually turns its back to any threat, stands motionless with bill pointed upwards. The Yellow-throated Longclaw roosts on the ground in grass. The flight of this bird is characteristically slow and jerky, flapping and gliding with tail spread showing white outer rectrices. The diet is mostly prey off grass or on the ground, and therefore includes a wide variety of insects, including grasshoppers, beetles, moths, mantids and ants, also millipedes, molluscs and some plant material.

They are monogamous and solitary nesters. The nest of the Yellow-throated Longclaw is built by the female, who is accompanied by the male while collecting material. The nest is made of coarse grass blades and stems, lined with fine grass. The nest is a bulky cup, usually well concealed on or just above ground in rank grass, normally under a tussock with overhanging grass blades.

The breeding season is from September to January and starts after good rains have fallen. The clutch is usually three eggs which are dull white in colour, with evenly distributed pale grey and brown speckles and streaks. The incubation period is 14 days and done mostly by the female. The incubating bird sits tight, flying off silently at the last moment when disturbed. The Yellow-throated Longclaw male often keeps guard from a prominent perch while the female broods the eggs. Young are fed by both adults and the nestling period is around 17 days. The young are well feathered on leaving the nest, but hardly able to fly.

In South Africa they are not threatened, due to their secretive behaviour.

#### ● The Late Willie Froneman



## The small but important wetland reserve of **VERLOREN VALEI**

Verloren Valei is a small but very important wetland reserve, just north-east of Dullstroom in Mpumalanga. Despite its small size, it is a Ramsar site, which means it is recognised as an internationally important wetland. During the past year, the Friends of Verloren Valei have played a role in helping the reserve management tackle two important problems.

James van den Heever  
Photographs by Gerrit van Ede

The first of these is to complete the fencing of the reserve. Owing to the poor performance of a contractor, some 4.4 kilometres on the north-western boundary remains unfenced. Without proper fencing, the game on the reserve can stray, and cattle from neighbouring properties can come into the reserve. We have provided equipment and fencing materials for this project, which is now nearing completion.

A second important challenge is that the reserve is traversed by a public gravel road which cuts through a notable orchid hotspot and wetland area. A lack of maintenance over many years means the road is virtually impassable and, more important, is causing large amounts of sand and stone to wash off into the wetland. Working for Wetlands and the Mpumalanga Tourism and Parks Authority are helping us to interact with the roads department and to obtain funding for the necessary planning and impact studies.

The Friends also participated in two workshops with Eco Africa, the consultants charged with creating the Integrated and Tourism Management Plans for the Reserve. We are particularly happy that our recommendation (that the whole Reserve be zoned as 'remote') was accepted, which should provide adequate protection for what is an extremely fragile ecosystem. Because Verloren Valei is a closed reserve, it is vitally important that there are ways for the public to visit it in a responsible manner. To that end, the Friends of Verloren Valei are working with the Reserve Manager to upskill the environmental monitors onsite. Recently, two of them attended a birding course run by the Escarpment Birding Club. The Friends group contributed to the fees and to buying binoculars and bird books for the monitors.

In tandem, the Friends group is busy developing a programme of field trips led by specialist guides. We have run the orchid field trips for some years, and late last year the Lepidopterists' Society led a field trip at Verloren Valei looking for butterflies, including the 'Warren's Blue' which is only found here. We hope they will run another outing this year. Other possible field trips include a geology and a wetlands field trip.

The Friends group of Verloren Valei looks forward to the coming year with some optimism as the reserve has a new Reserve Manager, who is committed, has a good vision for the Reserve and, best of all, has expressed her eagerness to work with us.

**James van den Heever**  
Secretary: Friends of Verloren Valei  
jamesh@tiscali.co.za

*Mass flowering of the Zigzag Crocosmia Crocosmia paniculata at the end of January 2018*

# All hail and farewell to a conservation legend

## JAMES MICHAEL FEELY



**Jim Feely was a very special Eco-Hero - a legend whose many contributions to our understandings in the linked fields of natural history, ethnology and archaeology are only now being given the light that they deserve. In particular this extraordinary environmental pioneer was one of the very few of his day that recognised that the conservation of cultural heritage was as important as conservation that protects the interests of the eco-environment - reflecting a holistic view of the world around him that set him apart from many others. Such is the legendary status of Jim Feely that it took time to begin the task of writing this tribute. But begin it I did and I can only trust that what follows will do justice to his life.**

Lynn Hurry

### The early years

Jim Feely was born in Tanganyika (now Tanzania) on 17 August 1934. After the death of his school-teacher father in 1938, his mother took him and his younger brother John to Cape Town, where he was educated at Bishops Diocesan College in Rondebosch, matriculating in 1951. This School House photograph shows Jim in his matric year, third row up, third from the right.

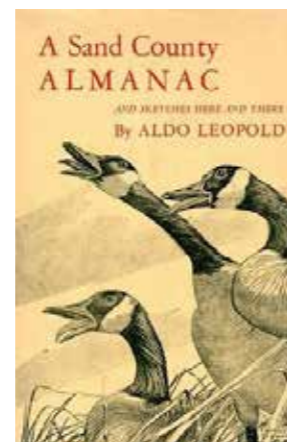


His daughter Debbie recalls that both at school and as an adult, he took a passionate interest in the global world around him. He had a substantial library of books which he collected over the years on wide-ranging subjects: conservation, natural history, archaeology, the origins of the iron-age people in South Africa, and world history, to name but a few. Feely took a particular interest in birds, both watching

them and collecting specimens and taking them home to study and practise his taxidermy skills.

After matriculating from 'Bishops', Feely spent a year at the University of Cape Town where he completed first year courses in Botany, Zoology, Ethnology and Archeology. Not finding university studies to his liking, he left UCT in 1953 to 'test the waters' of conservation in various positions over the next ten years.

He spent time in six different organisations, being a technical assistant at the Jonkershoek Trout Hatcheries; a junior ranger and later assistant ecologist in the iMfolosi game reserve; a game officer in the Luangwa Valley with the Department of Game and Fisheries of Northern Rhodesia; the organising secretary of the Natal Branch of the Wildlife Society of Southern Africa; and a safari guide with Zululand Safaris (Pty) Ltd.



In November 1972, with all the wealth of these experiences behind him, Feely joined the Wilderness Leadership School where he served with distinction until his departure for the University of Transkei in 1987.

### The call of wilderness

From an early age, Feely's inquisitive mind led him on a constant search for insights

into the world around him. As part of this journey he sourced a wide range of publications, and in his extensive personal library the works of American Aldo Leopold (1887- 1948) and Englishman Frank Fraser-Darling (1903- 1979) held pride of place. Both were pioneer protagonists of the wilderness concept, and the writings of both are now highly regarded for the roles they have played in shaping wilderness policy worldwide. Leopold's *A Sand County Almanac* was first published in 1949 and has become one of the cornerstones of modern conservation science, policy, and ethics.

Fraser-Darling's numerous writings and TV presentations put him on centre-stage during the 1960s and 70s. His 1969 BBC Reith Lectures - *Wilderness and Plenty* - were an important contribution to the growing debate on humankind's responsibility for his natural environment - being described by one commentator as "an eloquent statement of the dependence of all living things on one another".

### All Hail Mabekapanzi - the years with the Natal Parks Board



Feely joined the Natal Parks Board in 1955 when he was appointed as a junior ranger in the iMfolosi Game Reserve. Not for nothing, he soon earned the Zulu praise name of 'Mabekapanzi' ('the one who looks down') for, when he was out in the field, he not only searched the ground for tracks and signs of wildlife, but was also always on the lookout for signs and traces of human occupation of the land through which he walked. As Ian Player later wrote in *Wilderness* of July 1987: "he was always the scientist, observing and drawing conclusions and painstakingly writing it all down."

Interestingly, it was during his first years in the iMfolosi that Feely introduced Dr Player to the

concept of wilderness management. In addition to the works of Aldo Leopold and Fraser-Darling, he had acquired a copy of *The 11 Fundamental Principles of Wilderness*, a book by American naturalist Reuben Trippensee, and he shared this work with Dr Player.

As recalled by Drummond Densham, writing in *Save our Wilderness* of October 2015, this was an introduction which Dr Player was later to describe as a 'synchronistic event', since it set him off on a mission to get the iMfolosi and St Lucia wilderness areas designated. It was also the catalyst that led, in the late 1950s, to Dr Player initiating wilderness trails in the iMfolosi- Hluhluwe corridor, which in turn led to the establishment of the Wilderness Leadership School in 1963.

Not surprisingly, when Dr Player established Lake St Lucia as a wilderness area, it was Feely whom he appointed as its first Wilderness Trails Officer and where he led parties of trailers along its eastern shore, interpreting the landscape with fascinating insights.

The many trailists, who accompanied him on their walks through the Zululand reserves over the years, will remember Feely's lengthy discussions on iron-age sites. His awareness of the environment

through which they walked enabled him to instinctively find Iron Age sites that most other people would walk by without noticing. He was also the first to make the link between the sites of old Zulu homesteads, where the bush had been cleared and which provided important grazing areas for White Rhinos.

### Jim Feely and Operation Rhino

While Ian Player's name is internationally associated with the conservation of both species of rhinos and their re-introduction into other African states and around the world, it is not as well known that *Operation Rhino* would not have achieved its successes, had it not been for the early participation of

veterinarian and physiologist Dr Tony Harthorn. It was he who developed the M99 immobilising drug for use on rhinos, and it was Jim Feely who introduced him to Dr Player; which in turn significantly contributed to the successful work of the rhino capture teams.

### The Game Rangers' Association of Africa

In a letter to the writer, Drummond Densham recalls that Feely was instrumental in setting up the Game Rangers' Association of Africa in the 1970s and, according to him, the association still has the words he crafted in the original manifesto. Densham said that Feely "was very concerned about the future of South Africa's protected areas and wilderness areas,



never fearing to question the way that they were being protected and managed."



At the WLS : Jim Feely and Ian Player with Marais Steyn and his wife

**The Wilderness Leadership School Years**

In 1972, after 20 years of leading Natal Parks Board trails, Feely was invited by Dr Player to join the Wilderness School as a trails officer, and he stayed with the School for ten years, ending his time with them with the title of Field Director.

Wilderness School colleague Dr Bill Bainbridge recalls that, as Field Director, Feely expected field staff to

uphold the safety of the animals encountered on a wilderness trail since they were "just as important as that of our human charges". Bill also recalls that Feely believed that the most important role of trail leaders was to give trailers opportunities to personally experience their trails, "using all of their senses, as well as of their intellects, emotions and thoughts".



In the 1970s and 80s the school enjoyed halcyon days of success and influence, both locally and at an international level, and in 1986 some of those who had contributed to this success met at a reunion dinner in Johannesburg.

Pictured alongside Dr Player are (left to right) Hugh Dent, Ian Player, Ken Tinley, Magqubu Ntombela, Jim Feely and Paul Dutton. Significantly, with the exception of Magqubu Ntombela (Dr Player's close friend and mentor, whose contributions to conservation were recorded in a previous Eco-Hero article in *Environment* magazine, No. 10 of 2012), all the men in the picture had been mentored by Feeley in one or other way. It was he who had influenced them all in the ways that they thought about wilderness and the wilderness experience.

Not surprisingly, when Dr Player established the Wilderness Foundation in 1974, and then coordinated the internationally-acclaimed First Wilderness Congress in 1977, Feely was part of the team that put both events together.

**Record and writings**

Jim Feely will always be remembered as a man who contributed hugely to LIFE, not only in the personal communications that he had with so many, not only with the people he took out on wilderness trails, but also not through the 50 plus insightful writings that were published in a wide variety of influential journals, starting in 1950 when he was just 18 years old. *Ostrich, The Lammegeyer, Puku, African Wildlife, The Game Ranger, South African Journal of Science, African Zoology* and the *Bulletin of the South African Institute of Ecologists* all published his work.

**Answering the call of pre-colonial history**

Jim Feely's interest in Iron Age settlements in southern Africa was a thread that wove its way through all of his professional life. His knowledge of ecology, and his observations made over many long years, enabled him to instinctively find Stone Age sites that most others would never notice.

So it was rather not surprising that his passion for Iron Age history eventually led him to resign from the Wilderness Leadership School in March 1983, to join the University of Transkei (now the Walter Sisulu University) as a research associate. He spent three years there meticulously researching and writing up his results in a dissertation entitled *The distribution of iron age settlements in the Transkei: 470-1850*. This work resulted in the award of the degree of Master of Arts *cum laude* in 1987.

Such were the significant contributions that Feely made during his lifetime that his colleagues Dr Jeremy Anderson and Basher Attwell had decided that Feely's contributions should be recognised by the award of an honorary doctorate, and they were gathering information for this at the time of his death.

**Last postings**

Jim Feely's CV in the years after Transkei reflects



that he spent a year as a consultant ecologist in the department of Botany at the University of the Western Cape, followed by a year as the Principal Nature Conservation Scientist with the Department



**The lighter side of Jim Feely**

*Bill Spotswood recalls when one trailer - a snuff addict - had forgotten his tin of snuff. "No problem, Jim went off and collected some dead camelthorn twigs, a few dried aloe flowers and I can't remember what else. He dried this concoction in a pot lid over the fire without letting it catch fire, until it was all friable. He then ground it up into a fine powder with a wooden spoon. Jim said he had seen this snuff made by the Zulus many years ago and had never forgotten the recipe". Apparently it was a huge success with the trailer.*

*Clive Walker's account of Feely's lighter side is also worth repeating: "Legend has it that even the indomitable Jim Feeley was not immune from getting a good scare. He once had a close shave while out with a schoolgirl group similar to that on my training trail. Not part of Jim's plan was to wake up and discover that the young woman on watch had fallen asleep, and a black rhino was standing very close to the group. Any black rhino is too close, especially by the light of a flickering fire. Leaping out of his sleeping bag, he fired a quick shot over the head of the rhino, which promptly turned and fled into the blackness of the night. Stunned by the noise of his shot, the girls opened their eyes to the excitement of finding their leader standing with rifle in hand but devoid of clothing. He was grateful nothing worse had happened, but the girls' chaperone was not at all amused not least the language he used to add to the rhinos departure."*



Leadership School to take up a research position at the University of Transkei.

**Ave atque vale**

*Of all the wild beauty I have known – and there has been so much – yet it has been less than the benevolence of people who shared it with me. Of all the calls I've heard, of whispers on Loch Afric and lions along the Timbavati, none have been more stirring than words spoken by the fire. And as I go on to a more lonely life – in that same ancient veld – I shall be amply protected by those days and nights in the company of friends. Stay well.*



**Acknowledgements**

I owe a special word of thanks to Jim Feeley's daughter Debbie Marshall who kept in constant contact with me and who provided personal insights and rare photographic images of her father's life. Cheryl Curry, CEO of the Wilderness Leadership School is thanked for her help in accessing information and photographic records. Thanks to the following for their personal recollections, words and photographs: Drummond Densham, Bruce Dell, Paul Dutton, Dr Eugene Moll, Bill Spotswood, Dr Ken Tinley and Clive Walker. I also quoted from *Wilderness*, the official newsletter of the Wilderness Leadership School No. 23 July 1987 and October 30 2015: Dr Jeremy Anderson, Roger Whiteley, Dr Bill Bainbridge and the late Dr Ian Player.

**Dr Lynn Hurry**

The Honorary Editor of the Eco-Heroes series is Dr Lynn Hurry. Suggestions for future articles will be welcomed and may be sent to him at: [lynn@ecology.co.za](mailto:lynn@ecology.co.za) 083 361 2658

# WESSA MEMBERSHIP



WESSA is one of South Africa's oldest membership-supported, non-governmental organisations and for over 90 years has played a key role in the conservation of our country, helping to ensure sustainability for present and future generations through environmental action; education programmes; and human capacity development to empower individuals and communities to make sustainable choices. Friends Groups and Affiliate members make a valuable contribution to the work WESSA does in the areas of conservation and education as well as strengthening the environmental movement by networking and actively working in communities at a grass roots level.

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### Donations

As a non-profit environmental organisation we rely on the support of our members, sponsors and the general public. As such, we are most grateful for any additional donation you are able to give. WESSA is a Section 21 company registered as an Incorporated Association not for gain with Section 18A status.

# Leaving a LEGACY



WESSA has played a key role in the conservation of our country's natural heritage. Our mission is and remains to implement high-impact environmental and conservation projects, which promote public participation in caring for the Earth. As an NGO, we depend on funding from individuals and businesses to make possible the work we do. Unrestricted gifts allow us more flexibility in dealing with environmental priorities. Below are some examples of options you might like to consider.

All of us would like to leave this world knowing we're passing on a healthy and thriving planet to our children and others. One of the most significant ways to show your support and passion for the conservation of the earth, and all that lives upon it, is to leave a bequest to WESSA in your will. Making a will ensures that everything you have worked hard for in your life is passed on to your loved ones and the causes you care about. A bequest is a personal gift of great importance and a lasting legacy to your beliefs and values. It is thanks to bequests made that WESSA is able to run hundreds of conservation projects, protect many species and improve the quality of people's lives – today and into the future.

If you already have a will it is easy to add a codicil which names WESSA (the Wildlife and Environment Society of South Africa) as a beneficiary.

### A Specific Sum:

This is the simplest form of bequest. However, it does not allow for inflation or charges within your estate.

### A Residual:

After making provision for your family and friends, you may wish to leave the unallocated portion of your estate to WESSA.

### A Percentage:

Often it is difficult to predict the final value of your estate. By giving a percentage of the total, rather than a fixed amount, you can be sure that all your beneficiaries will receive the stipulated share.

### A Gift of Real Estate or Property:

This may be made outright, or you can arrange for the property to pass on to WESSA after the death of another beneficiary, such as your spouse.

### An Assurance or Endowment Policy:

Often an insurance policy taken out years ago loses its relevance as you get older. Such a policy may be ceded to WESSA as the beneficiary.

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Registration Number in Terms of the Non-Profit Organisation Act 1997: 000-716NPO

Tax Exemption Number:

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Photograph: John Wesson

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- New and renewal membership
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 Phone: 031 303 6099



See also, regional contact details on page 1

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| <p><b>EXTRA POSTAGE:</b> International &amp; SADC country magazine subscribers add extra postage (per annum) as follows:<br/>                     LEVEL A: INT R745 SADC R485   LEVEL B &amp; D: INT R290 SADC R215   LEVEL C: INT R175 SADC R140</p> <p>SADC COUNTRIES: Angola, Botswana, Burundi, Comoros, Congo (DRC), Congo (Peoples Rep), Gabon, Kenya, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Reunion, Rwanda, Seychelles, Swaziland, Tanzania, Uganda, Zambia and Zimbabwe.</p> |                |   |         |     |          |  |  |  |  |
| <p><b>BANK ACCOUNT DETAILS</b><br/>                     Name of Account: WESSA Membership<br/>                     Bank: First National Bank<br/>                     Branch &amp; Code: Howick 22-07-25<br/>                     Account Number: 62 219 969 732</p>   |                | <p>1. <b>EFT   DIRECT DEPOSIT:</b> Deposit ref: Initials &amp; Surname + membership number if existing member<br/>                     2. <b>ONLINE:</b> Go to: <a href="http://www.wessalife.org.za">www.wessalife.org.za</a><br/>                     3. <b>DEBIT OR CREDIT CARD:</b> Complete details below and return.<br/>                     4. <b>CHEQUE:</b> Cross and make payable to WESSA</p> |         |     |          |  |  |  |  |
| Payment type & amount  | Payment amount | R   | Renewal | New | Donation |  |  |  |  |
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| CVV Number   |                | Expiry Date   |         |     |          |  |  |  |  |
| <p><i>All necessary precautions will be taken to ensure compliance with the Protection of Personal Information (POPI) Act 4 of 2013</i></p>  |                |   |         |     |          |  |  |  |  |



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