

| MICHAEL SAMWAYS |

TOP THREE AWARDS

- IUCN Chair's Citation of Excellence, 2014
- ASSAf's Science-for-Society Gold Medal, 2008
- Gold Medal of the *Suid-Afrikaanse Akademie vir Wetenskap en Kuns*, 2016

DEFINING MOMENT

My first memory is of watching grasshoppers in long grass. I must have been three or four years old. I was fascinated by them, how they lived, what they thought, how they went about life. From that moment, I never wanted to do anything other than work on insects.

WHAT PEOPLE DO NOT KNOW

I once had a face-off with a green mamba at the top of a citrus tree in Mpumalanga. I was collecting samples when I spotted the deadly snake only 50 cm away. I calmly told it: "You aren't going to bite me, are you, and I shall not bite you." The snake must have understood, because we both slowly backed out of there, each unharmed.



FOR THE LOVE OF INSECTS

Whether traipsing around a Stellenbosch vineyard or scuba diving in the Seychelles, Professor Michael Samways' quest is always the same: To discover ways to safeguard local animal and plant life while at the same time allowing for reasonable exploitation of the local resources.

For a conservationist, he is refreshingly pragmatic. "It's all very well sitting in ivory towers saying we all have to love nature. But to actually do something about it, you have to engage with the people who use the land, or who live on it," he says.

For the interview, we sit in his Cape Winelands kitchen, which offers breathtaking views of the Hottentot Hollands mountain range. The mountains are old, he explains, much older than the Alps. For millions of years they have been a natural refuge that has led to the Cape evolving its unique biodiversity, he says.

Today, of course, many of the region's endemic species are threatened by invasive plant species. Part of his work at Stellenbosch University (SU) in the Department of Conservation Ecology and Entomology, has been to devise ways to reinstate and strengthen the original ecosystems so they can cope with new threats.

Samways' research has ranged from pest control in citrus farming to landscape ecology and environmental ethics. But he has always been most fascinated by insects, and much of his work has converged on illustrating just how important the services are that creepy crawlies render in nature, such as regenerating soil and pollinating crops.

EARLY LIFE AND EDUCATION

Samways himself is an alien of sorts in these parts. Although resident in South Africa since the mid-1970s, he grew up in rural England in the 1950s and 60s. As a child he wandered through the woods and fields of the Chilterns, marvelling at the natural world around him.

At school, he won prizes for biology, and in the sixth form (British matric) he won the prize for zoology. He enrolled at the University of Nottingham to study zoology, and although by his own admission he didn't take his formal undergraduate courses that seriously as he liked to read around much more widely. He graduated with honours in 1971.

If university wasn't serious business to Samways, nature, by contrast, was. During his student days, there were signs all around him that the natural world was struggling with unprecedented pressures brought on by human activity.

In 1969, the British conservationist, Peter Scott, published a book on endangered animals. Scott's *The Red Book – Wildlife in Danger* was a forerunner of the Red List maintained by the International Union for the Conservation of Nature, for which Samways would work later in life.

However, even in the late 60s, Samways was concerned by the lack of insects in the *Red Book*. The book focused on vertebrate animals. But from his own readings and experience, Samways knew that insect numbers were also dwindling, with some species from the old British records having disappeared entirely; "The world was getting poorer," he recalls.

Samways spent part of his PhD in southern France, tracking down and studying two species of bush crickets that his supervisor had heard about when he visited the area in the 1960s. The strange thing about the crickets was that their mating calls would interfere with each other, corrupting the message and making it harder for either species to find a mate. So why would they live in the same area?

Through his research, Samways found that the two species had indeed not evolved together. Instead, they had been pushed into artificial contact by changed land use in the region, caused by growth in the local city of Montpellier. This interaction between human development and the natural environment intrigued Samways and he wanted to study it more.

After receiving his PhD in entomology from the University of London in 1975 he took a correspondence course in tropical agriculture. Following that, in

the late 1970s, he went to Brazil as a visiting entomology Professor at the *Escola Superior de Agricultura de Lavras*, where he worked on producing fuel alcohol from cassava.

"I was going to save the world," he says. But what he saw in Brazil changed his mind about many things. Rather than a green alternative for generating power, the biofuel plantations he saw in Brazil were destructive monocultures. "We were making fuel out of this thin green veneer of life on the planet, and it was clearly devastating for biodiversity," he says.

Before Brazil, Samways studied the use of biological pest control in agriculture -- using natural enemies such as parasites or predators to keep crop pests in check instead of dousing fields in insecticide.

However, in Brazil he found that the enormity of the cassava fields meant that biological control agents could not penetrate into them, since they need a more varied ecology to thrive. "That's when I realised that extensive monocultures were not a good idea."

MOVE TO SOUTH AFRICA

In 1979, Samways was invited to Nelspruit in north-east South Africa to work at the Outspan Citrus Centre as a senior entomologist. It was an interesting part of the world, Samways reasoned, and he was keen to work on real-world problems. At the time, citrus trees in the region were badly hit by red scale, an insect pest that had become resistant to insecticides. To make things worse, widespread pesticide use had killed off the bug's natural enemies, and the infestation was so severe that trees were dying.

Samways looked to biological control mechanisms to solve the problem. There was a ladybird, *Chilocorus nigritus*, which feeds on the red scale insect. By introducing these ladybirds on a massive scale into the orchards, Samways and his colleagues managed to bring the red scale infestation under control. They solved the problem using nature's own ingenuity.

After seven years in Nelspruit, Samways was invited to apply for a Chair in Entomology at the School of Botany and Zoology at the University of Natal

(today the University of KwaZulu-Natal) in Pietermaritzburg. He applied and was accepted, even though he was still only in his thirties.

For the first time in his life he was a full-time academic. Mindful of insects still not being prominent in global conservation efforts, he began working on developing insect conservation as its own field. He started an Invertebrate Research Conservation Centre at the university, and was eventually invited to join the International Union for Conservation of Nature's steering committee as a specialist on invertebrate conservation.

Slowly but surely, insect conservation was getting a bigger audience. In 1995, a book written by Samways titled *Insect Conservation Biology* was published by Chapman and Hall in London to great international acclaim. During the 17 years that Samways stayed in Pietermaritzburg he embarked on ambitious conservation projects focusing on sustainable land use. For example, he worked with major timber companies in the province to develop large-scale ecological networks, leaving remnants of natural land scattered throughout the plantations. This allowed the natural biodiversity to survive, preserving the insects and invertebrates that scientists now know are absolutely crucial. It was one of the first projects in Africa to receive a grant at the time from the World Wildlife Fund that didn't focus on large mammals or birds, but on the land itself.

Also during his time in KwaZulu-Natal, Samways began working on tropical island conservation. The project focused on an island in the Seychelles archipelago called Cousine. The island had been exploited as a coconut plantation before 1968, but later was privately purchased to save the endemic Seychelles plants and animals.

From its severely degraded state, Cousine has been restored to its near-pristine natural state. Today it is a sanctuary for many species of animals and trees, including the Hawksbill turtle. In the Seychelles, and also on the KwaZulu-Natal coast, Samways studied coral bleaching, and developed a method of using butterfly fish as an indicator species for the health of the reefs. This was summarised in the book for which he was lead author *Tropical Island Recovery* published by Wiley-Blackwell.

LIFE IN THE WINELANDS

In 2003, Samways moved again, this time to SU in the Cape Winelands. Here he merged two departments – conservation biology and entomology – into a strong research centre with fruitful links with society and industry. He was Chair of the department until 2014, when he stepped back from the post but remained a Professor (now Distinguished Professor) in the department. During this time, he also published the major book *Insect Diversity Conservation* (Cambridge University Press) and was lead author for another significant book *Insect Conservation: Approaches and Methods* (Oxford University Press). Over his life he has also developed some more esoteric interests. His house is filled with art and sculpture, and he has authored a self-help book about finding love, harmony and happiness titled *Alchemy of Love* (Ayni Books, 2014).

At Stellenbosch, Samways and his team have worked with local conservation initiatives to make sure their work translates into impact on the ground. In collaboration with Working for Water, a national initiative that fights invasive alien plants, they were able to demonstrate the impact alien species can have on ecosystems, especially on water availability, and the speed with which indigenous species can recover once alien species are removed.

Working with the Biodiversity in Wine Initiative, his department has also played a key role in what Samways calls 'future-proofing' the wineries of the Western Cape. This has been side-by-side with extensive research in KwaZulu-Natal with the large forestry company, Mondi, to develop new approaches optimising timber production, while maximising conservation of biodiversity and ecosystem processes. The project has a dual benefit by making wineries and afforested lands not only environmentally sound and attractive, but also financially sustainable, since a light environmental footprint is at a premium when selling to certain lucrative markets such as Europe.

He says that he, as an academic, as well as industry representatives and large-scale farmers can learn a lot from interacting with small-scale farmers in South Africa who have an intuitive way of working the land sustainably. For instance, in KwaZulu-Natal he came across small-scale sugar cane

farmers who were not using any insecticides, but who relied on natural control measures.

Rural communities are also essential for conserving threatened species, he adds. A community in northern KwaZulu-Natal was found to be the home of a dwindling population of a rare butterfly, the Karkloof Blue. Overgrazing and veld fires were destroying the butterflies' breeding cycle. But once the villagers were told about the butterfly and how rare it was, and once they knew how to protect it by reducing grazing in the nesting sites and by creating fire breaks, they adopted the butterfly as the village emblem. Ensuring that the butterfly thrived thus became a community priority.

Because of success stories like these Samways enjoys his work as much as he ever has, despite the often-depressing news coming out of global environmental monitoring programmes. Conservation is a big puzzle, he says, and you need everyone to be involved – from the scientists to the villagers across to industry – to solve it.

The biggest bottleneck is economic pressure. Farmers and other land-users need to make money. But with the extra value being put on eco-friendly produce these days, he believes there are ways around this. The challenge is to change peoples' minds before it's too late. "To do something about things, you have to market the subject so that people know they can benefit from it. That's the real-life situation," he says.

His department at Stellenbosch hosts open days and school visits to encourage children to become more aware of environmental issues. This is an activity close to Samways' own heart. Having grown up with nature right outside his door, he feels for children today who don't get to play in nature because their parents fear for their safety, or simply because their teachers often find it difficult to take them outside.

"You don't need to live on the edge of a nature reserve to interact with nature," he says. Any urban park, any town common, will have insects that will allow children to interact with nature, just as he did in the Chilterns as a child. "The variety of nature feeds our eyes and brains."