

Biosphere Birdwood



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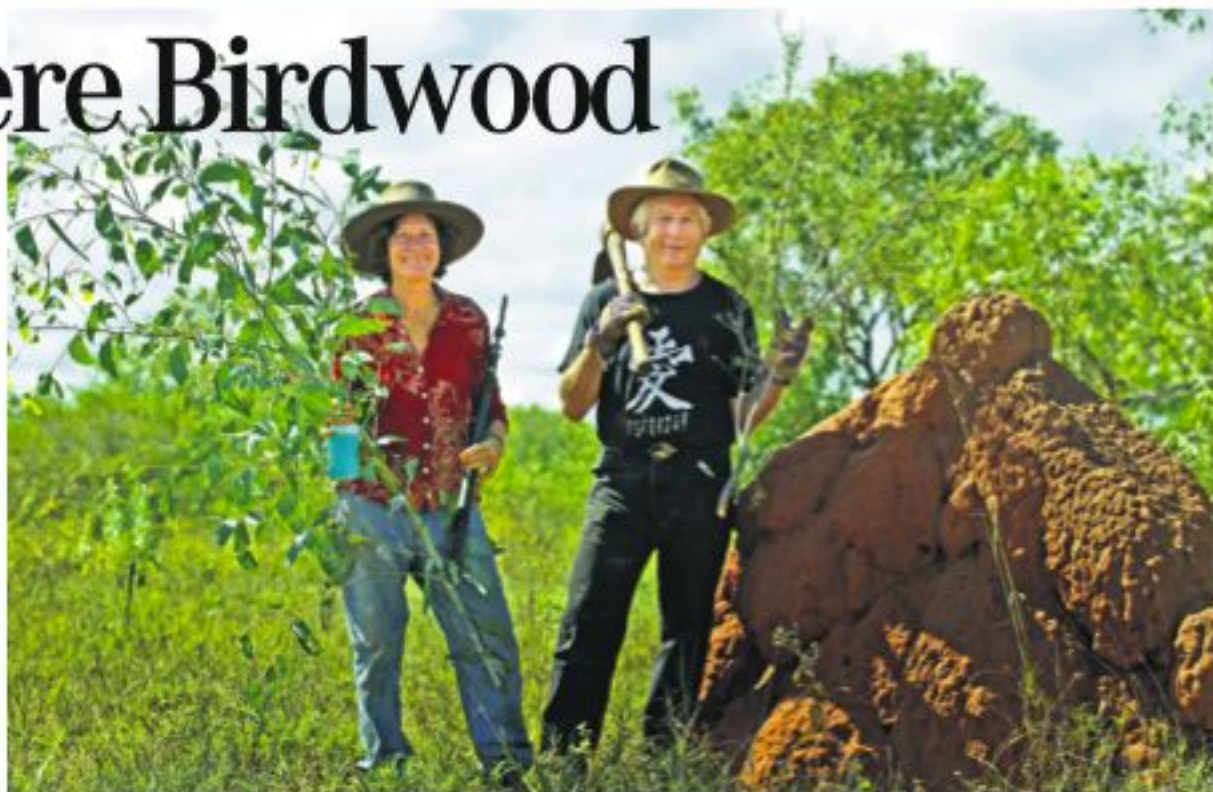
The minds behind a Kimberley savannah want us to rethink the way we live

Wiry and slight and wearing a battered akubra hat, Robyn Tredwell fixes us with a piercing gaze. We have just arrived at Birdwood Downs Station, 16km east of Derby down the Gibb River Road and our barrage of questions has not gone down well.

"No more questions," she says. "Stop, take a breath, chill out, take it in. There will be time for questions later. I can talk to you in the morning."

Suitably chastened — and warned not to bother any other people we might encounter — we find our cottage and flop on to the beds.

Later, as we tiptoe around the homestead, listening to the birds twitter in the trees, even more maddening questions arise. Why are there so many genial Americans around? Why aren't we allowed to talk to them? Who on Earth are the Biospherians? What is this place?



Bush paradise: Robyn Tredwell and Institute of Ecotechnics director Mark Nelson at Birdwood Downs. Pictures: Mogens Johansen

The next morning it's already hot but Ms Tredwell and her colleague, Mark Nelson, don't care. Sweat trickling down their faces, they hack away at the invasive calytrix shrubs and wattle seedlings trying to strangle the grass and legumes planted in their paddock.

When he's at Birdwood Downs, this is how Dr Nelson spends the first few hours each day — and strangely enough, he loves it. "It's field maintenance, protecting our improved pasture," he says. "I really wish I could spend more of my life here, like I did in the early years after we started the project."

For the softly spoken American,

born in New York and living between the Kimberley and an affiliated ecological project in New Mexico, Birdwood Downs is far more than a rural pastoral enterprise.

To him — and the Global Ecotechnics Corporation, which owns it — Birdwood Downs is a tropical savannah experiment of worldwide significance.

As a longstanding director of the Institute of Ecotechnics, which had its origins in New Mexico in 1973, Dr Nelson is among those living by the mantra that humans must live in balanced harmony with technology, ecology and culture. On September

26, 1991, he was among eight people who shut themselves off from the world — along with 3800 species of plants and animals — inside a 1.2ha "biosphere" in the desert between Tucson and Phoenix, Arizona.

The \$200 million, eight-storey 15,000sq m compound, covered by glass and steel structures, was dubbed the world's most ambitious test tube, a "closed ecological system" intended to represent a mini-Earth, or "biosphere".

It contained five "biomes" — a magnificent rainforest, ocean with coral reef, wetlands, a desert, an agricultural production system and a savannah grassland — modelled

mostly on Birdwood Downs. Dr Nelson says the biospherians wanted to find out whether people could live successfully as an integral part of a complete ecological system — long before the term "sustainability" was common.

In keeping with the ecotechnics view that art and culture are also essential to human existence, the architecture inside was not just practical, but beautiful too.

"The essence of the experiment was: can humans, technology and agriculture coexist harmoniously with natural systems," Dr Nelson says. "The other goal was to change the way people were looking at space exploration. If we're really going to live happily in space stations, on the Moon or Mars or whatever . . . we need to think of people as living in biospheric systems."

Inside the dome, certain species thrived, while others died out. When the gardens failed to produce the hoped-for bounty of food, crew members suffered dramatic weight loss of up to 23kg. Eighteen months in, oxygen levels dipped to dangerously low levels after microbes in the rainforest metabolised organic material at abnormally high rates, meaning air had to be pumped in so the occupants could survive.

Millions of people around the world watched as the biospherians, skinnier but triumphant, emerged from the dome in September 1993.

In ensuing years, the project had many spin-offs. One was the constructed wetland system developed in conjunction with NASA scientists, a way to recycle and reuse all the wastewater and effluent from the people, workshops,



From P39

laboratories and animals inside.

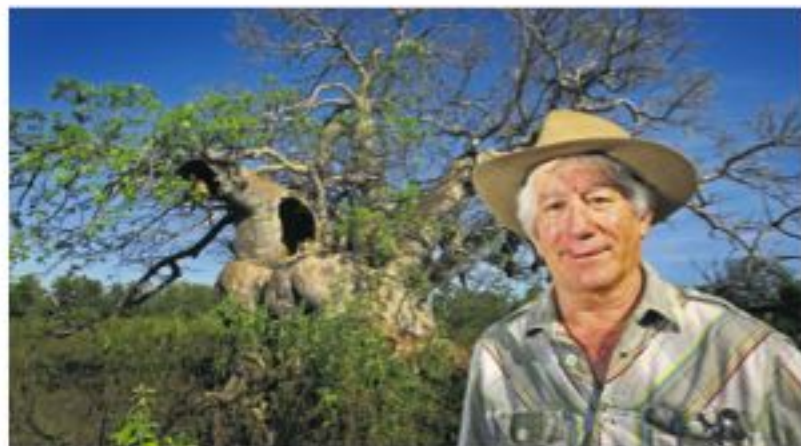
Foliage from Dr Nelson's wetland was used to feed animals, while treated effluent was sterilised and added to the farm's irrigation supply, recycling all the nutrients. After re-entering the "real world", Dr Nelson continued to develop the system which is now used worldwide — including the Birdwood Downs homestead and several Aboriginal communities in WA.

While many later ridiculed the Biosphere 2 experiment and questioned its scientific validity, Dr Nelson believes it was an incredible success.

"I wish in a way that we had done the project now, because public awareness of ecological challenges has grown so much," he says. "But even so, Biosphere 2 was followed with excitement by millions of people around the world. There were unexpected surprises, like the oxygen decline, but to my mind that illustrated why we needed to build such a facility . . . a lot of people kind of missed the point that it was a very daring and visionary experiment."

"What I really got from Biosphere 2 is that every small action in there had consequences. If we had taken conventional agriculture and technology in there, we would have been dead from toxic chemicals and pollution. The public education, even if we were 50 years ahead of our time, was the best thing that Biosphere 2 accomplished."

A second "mission" into Biosphere 2 involving a different crew of seven was abandoned in 1994 after just six months, amid financial squabbles, relationship breakdowns and allegations of



Lessons from the dome: Mark Nelson says Biosphere 2 was ahead of its time.

'What I really got from Biosphere 2 is that every small action in there had consequences.'

DR MARK NELSON

sabotage. Today, Biosphere 2 is operated by the University of Arizona as a research facility.

But the tropical savannah biome at Birdwood Downs lives on, thanks largely to the efforts of Ms Tredwell, a former Australian Rural Woman of the Year.

Tough and no-nonsense but with a ready grin, she is as hardy as the landscape she cares for — and it's just as well, because it's backbreaking work.

Born into a fifth-generation family of pastoralists and fishermen from northern Queensland and NSW, she travelled the world working in midwifery and neonatal intensive care.

In the late 1970s, she set up a health clinic for refugee Tibetans in Kathmandu before encountering the Institute of Ecotechnics' research

ship Heraclitus — a sailing ship like a Chinese junk — in Tibet in 1980. After "a collision of minds", she jumped aboard, spending the next five years sailing tropical climates, collecting medicinal and agricultural plants and seeds.

She arrived at Birdwood Downs six years after the institute took it on in 1978, when Dr Nelson was its general manager. Back then, the landscape was heavily degraded by overgrazing, over burning and trampling from three stock routes running through it.

The WA Government had sold the land on the provision that its pasture was improved with drought-resistant grasses and legumes. To finance that Birdwood Downs produced seeds which it exported.

Ms Tredwell says initially, the idea of creating a sustainable system in the tropical dry savannah had been a "huge challenge".

"Particularly as my colleagues had chosen the most degraded piece of land," she chuckles. "We had to learn by doing, as there was no manual on how it could be done."

After about eight years of



Take a breath: Robyn Tredwell

"intensive work and sweat equity and capital investment", Birdwood Downs became freehold and is the second longest continuously owned and operated station in the Kimberley.

Since those lean early years, Ms Tredwell has developed a stock rotation system, successfully using grazing animals to assist seed production and increasing Birdwood Downs' sustainable stocking capacity to 10 times that of Kimberley native pastures.

Birdwood Downs has diversified, but it still follows the principles of ecology, technology and beauty. A decade ago, Ms Tredwell started the Kimberley School of Horsemanship, which offers accredited training and she breeds Quarab horses — a cross between the Arab and quarter horse. In keeping with the belief that humans must have a creative outlet for a satisfying life, the Crow and Cockatoo theatre was established.

More recently, tourists have been welcomed to Birdwood Downs, where they can taste the natural life by camping among the coconut palms and native trees and learning

about the environment by taking homestead or ecological tours.

Or, they can sleep in ecologically-friendly Kimberley colourstone solar-powered cottages, with double-vented pyramid roofs and no air-conditioners, enjoying the sound of birdsong and the croak of frogs through the flyscreen walls.

"We don't let those motorised things with the TV and the radio come blaring in," Ms Tredwell says.

"We're edging into it, because people come here for the quiet."

Ms Tredwell says while Birdwood Downs is still a work in progress, it has come a long way.

"Ecology develops slowly and fixing it develops slowly," she says. "If you make sustainability part of your life, then you're always adjusting and always recalibrating. You don't do it all in a day."

Dr Nelson says the growing public interest in climate change today is encouraging, as it means people are starting to take responsibility for their role in looking after the planet.

"Even the greatest deniers of what is actually happening on the planet can understand that what we're doing now is unsustainable — and it's going to get harder and harder, and more personal for everyone," he says. "We need to rethink how we live, learn to really live sustainably and healthier with our precious biosphere, but this shouldn't be seen as a hardship."

"People tend to get dwarfed by the magnitude of the Earth — that's not the right way to think. We want to demonstrate here at Birdwood Downs that living ecologically, to be hands-on in a real way at a small scale, is a really great way of life . . . if you put yourself in an intelligent, real relationship with the biosphere and your own little chunk of it, that's really very satisfying." **Agenda**

Wastewater recycling brings in the green

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A wastewater system developed in part by NASA scientists is being used by some WA Aboriginal communities, cutting water costs, reducing the threat of disease and turning barren land into gardens.

Two years ago, Pandanus Park Aboriginal Community, 50km south of Derby, was the first to install five "wastewater ecoscapes" to service eight houses and a child-care centre.

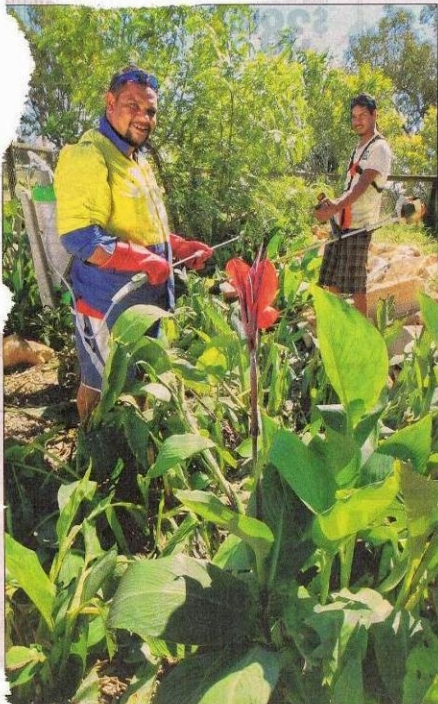
The system treats black and grey water in a septic tank for several days before feeding it into a garden bed, lined with a membrane and filled with pebbles and wetland plants.

The plants strip nutrients from the water and neutralise pathogens. The clean water is then fed into garden beds planted with tropical fruit trees, shrubs and "bush tucker" plants.

Pandanus chief executive Peter McCumstie said each garden cost up to \$30,000, paid for by community water grants and Department of Housing funding, but was cheaper and easier to maintain than traditional wastewater systems.

A Department of Housing spokeswoman said the project had increased water reuse and improved hygiene.

The system has its origins in Biosphere II — a 15,000sqm compound built in the Arizona desert in the US to test whether humans could survive in a "closed ecological system".



Barren to green again: Arnold Sahanna, left, and Ashton Lockyer tend a wastewater garden at Pandanus Park near Derby.

Picture: Nic Ellis