

The Groundswell Marquee

BEATING AROUND THE BUSH SINCE 2016

A PUBLICATION OF THE KANDOS SCHOOL OF CULTURAL ADAPTATION

SATURDAY 13 MARCH 2021

EXCLUSIVE

**AN ARTIST
A FARMER
AND A
SCIENTIST
WALK
INTO A BAR**

INCLUDES FREE PULLOUT POSTER!

Acknowledgement of Country

We the artists, farmers, and scientists in this project wish to thank the Traditional Owners of the places on which we live and work. The stories in this newspaper were developed on Dabee, Wiradjuri, Gamilaraay, Wirrayaraay, Nganyaywana, Anaiwan, Dharug, Wurundjeri, Bunurong, Naarm, Bundjalung, Dharawal, Wadi Wadi, Gadigal, Eora, and Yuin Country.

We pay our deepest respects to elders past, present and emerging, and acknowledge that these lands were never ceded.

Contents

ARTIST, FARMER, SCIENTIST

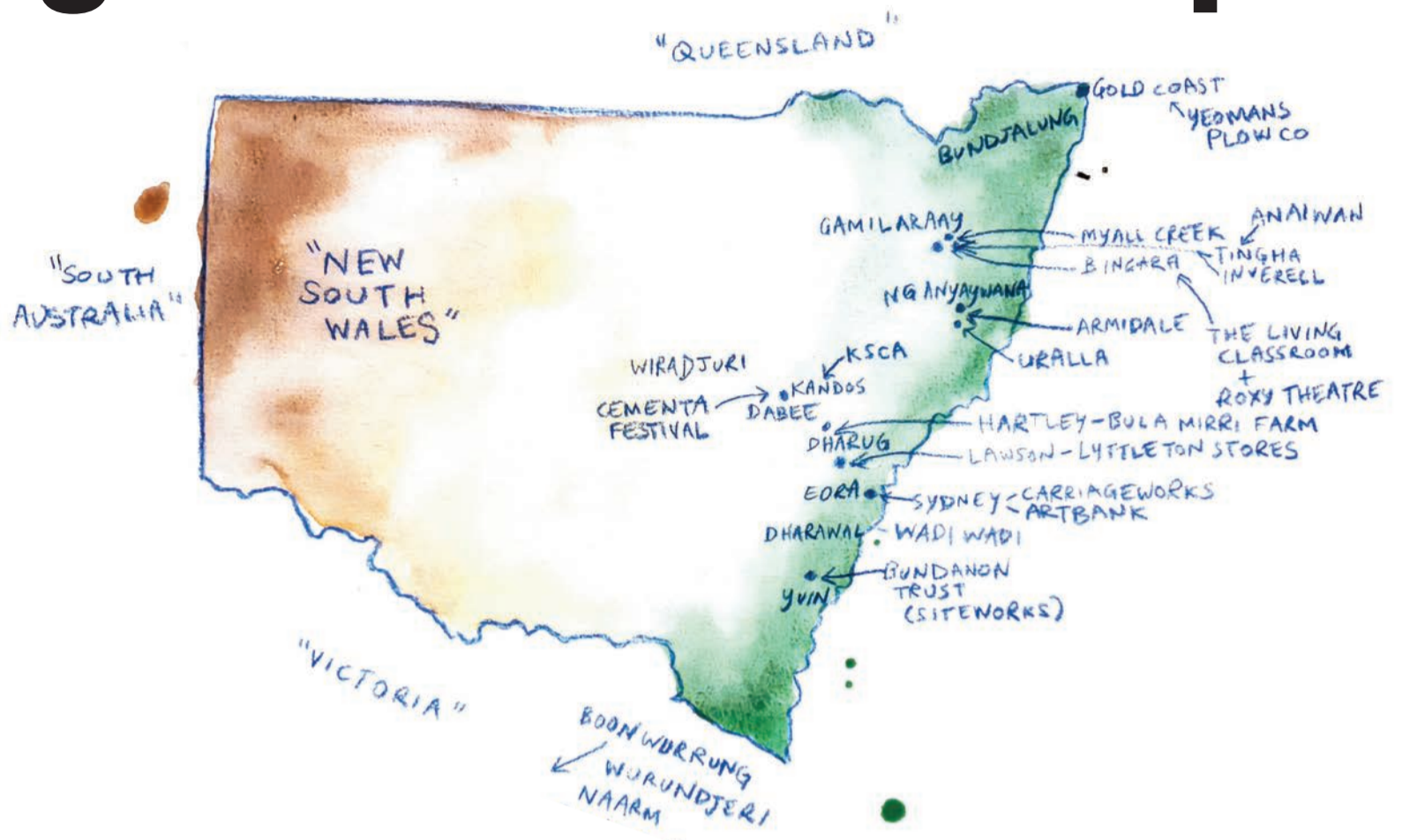
- 3 It began with a road trip...**
Laura Fisher, Lucas Ihlein & Vickie Zhang
- 4 Mother's little helpers**
Karla Dickens
- 6 An unlikely collaboration redefines a physicist's approach to climate**
Bjorn Sturmberg
- 7 ...While the sun shines**
Erika Watson
- 8 Harvesting sunshine**
Mark Swartz
- 10 The Living Classroom in Bingara**
Rick Hutton
- 12 A serious comedy in one act**
North West Theatre Company
- 14 Falling in love with carbon**
Georgie Pollard
- 16 Uncertain territory**
Georgie Pollard, Rick Hutton & Imogen Dixon-Smith
- 18 An artist, a farmer and a scientist walk into a bar... and learn about biochar**
Ruy Anaya de la Rosa
- 20 Farmers in flux**
Imogen Semmler
- 22 Wildfood Store**
Diego Bonetto
- 24 Baking earth: soil and the carbon economy**
Lucas Ihlein
- 26 What is humus?**
Laura Fisher
- 27 Humus House**
Jonathon Bolitho
- 28 Humus: essential for life**
Glenn Morris
- 30 Makeshift memento**
Georgie Pollard
- 32 Earth Oracle**
Alex Wisser
- 34 Carbon science: carbon culture**
KSCA and The Living Classroom

GROUNDWELL AND BEYOND

- 35 Introducing Groundswell and Pulse of the Earth**
Garry McDouall and The Gwydir News
- 37 Earthworm power!**
Lee Fieldhouse & Kirsty Hughes
- 38 Keep a green bough in your heart**
Charles Massy
- 40 A day in the life of soil**
David Hardwick interviewed by Laura Fisher
- 42 Myall Creek Memorial**
Myall Creek Memorial Committee
- 43 Going down fighting**
Ian Milliss
- 44 Regenerating earth, landscapes and communities**
Rachel Lawrence
- 46 Red 8 Produce**
Sarah Burrows & Anita Taylor
- 47 Community Weathering Station**
Jennifer Hamilton
- 47 Indigiearth**
Sharon Winsor
- 48 "ABC it takes a bee" (with ukulele chords)**
Amelie Vanderstock
- 49 For the change we want**
Southern New England Landcare
- 52 Land Studio**
Laura Fisher
- 54 Tuning in to your inner conservative**
Ananth Gopal
- 56 Serres' Ark: crossing disciplines at Groundswell**
Vickie Zhang

It began with a road trip...

LAURA FISHER,
LUCAS IHLEIN &
VICKIE ZHANG
(EDITORS)



In 2016, the newly-formed Kandos School of Cultural Adaptation (KSCA) staged *Futurelands2*, a two day experiment mingling art, food, farming, ecology and sustainable innovation. The setting was Kandos, a post-industrial town in Central West NSW, Australia, a district where mining, farming and conservation jostle together.

Among the presenters at *Futurelands2* were Adam Blakester and Jill Moore-Kashima. Hailing from Uralla and Armidale (roughly 350km north of Kandos) Adam and Jill convinced KSCA there was something extra sparkly in the water in their part of the world. They sensed a kinship between the community they knew and the “vibe” of KSCA: creative, unconventional, collaborative, and pushing against the tide of rural decline. In their region, some bold characters were transforming farming for the better and putting energy into rural regeneration. Among these remarkable people were Rick Hutton and Garry McDouall, who had led the transformation of a neglected commons in the town of Bingara into an education site for regenerative agriculture. They named this place The Living Classroom.

So in early 2017, a bunch of KSCA members hit the road and discovered they were right. We visited farmers, met local artists and stayed at The Living Classroom’s brand new bunkhouse. We experienced a moving tour of the Myall Creek Memorial, the only heritage listed site in Australia that commemorates a massacre of Aboriginal people, and now a place of pilgrimage for people to dwell, show respect and heal.

What was so striking about the meeting of minds on that trip was the sense that small rural communities, frayed by economic stress and population drain, are sometimes the perfect place for ingenious projects to find their way into the world. Beautiful things can happen when imaginative and foolhardy people decide to invent an exciting future for the communities and environments they

love. In places like Kandos and Bingara, innovative ventures blossom through sheer gumption and the pleasurable energy of collaborative creation precisely *because* most of society’s attention is focused elsewhere and resources are scarce. And surrounding these two towns, farmers like Tim Wright, Judi Earl, Glenn Morris, Peter Andrews and Stuart Andrews stubbornly pursue their convictions that it is possible to have a productive, profitable farm without destroying the land. They demonstrate how to adapt farming to Australia’s fragile ecological systems and perennial water-scarcity. Those farmers are not only resisting the current conventions of the Australian farming sector, but they’re also challenging the methods of the scientific establishment.

For KSCA, these stories are the essence of cultural adaptation.

This newspaper is about that spirit of adaptation, which can also be thought of as the spirit of resisting stagnation. We all know that our professions, our research disciplines and our artistic practices can stagnate. It’s hard to be responsive to a fast-changing world, and sometimes we can remain attached to truths and meanings that once made sense, but don’t any longer.

What is the antidote? Free and vulnerable conversation, the cross-pollination of knowledge, collaboration across distance. Situations where disagreement and confusion don’t stifle dialogue, but are the starting point for generous interactions. The chance to experiment in scenarios where the stakes aren’t too high. In KSCA’s view, when you make all that happen, *you’re making art*. It’s not the kind of “Art” most people are familiar with, but when you’re in the midst of it, you definitely know it’s happening...

The KSCA project *An artist, a farmer and a scientist walk into a bar* was dreamt up to create a vessel for those very processes. We selected a group of artists, and drew up a list of eight topics that would put them at the coalface of exciting adaptations in

the way we perceive the land, care for the land, and respond to a volatile climate. We invited some stellar individuals to work with us and were delighted that they said “yes”. We were welcomed by Rick, Garry and others in Bingara who saw that the project could spark new conversations in their community, particularly around the goals of The Living Classroom. And we were thrilled when Create NSW gave us the funding, trusting that we could steward such a prolonged project where the outcomes could never be predicted.

And so the eight *Artist Farmer Scientist* projects began. Karla Dickens started working with Uncle Bruce Pascoe to make a video about suffering Country (see pages 4–5). Diego Bonetto founded an enterprise selling weeds foraged by rural landowners to swanky city bars and restaurants (22–23). Imogen Semmler interviewed farmers who were in the early stages of their regenerative journeys (20–21). Alex Wisser selected a site at The Living Classroom and dug a massive hole (30–33). Jonathon Bolitho, Laura Fisher and farmer Glenn Morris tackled the mysteries and necessities of humus in soil (26–29). Artist Mark Swartz, physicist Bjorn Sturmberg and farmers Erika Watson and Hayden Druce put their heads together to devise a solar energy sculpture that blended plants and photovoltaic systems (6–9). Georgie Pollard dove into biochar, a method of repurposing organic waste to create a carbon-rich soil amendment (14–19). And Lucas Ihlein worked with inventor Allan Yeomans to exhibit a device for measuring soil carbon into a pristine art museum in Melbourne (24–25). Each project built momentum over two years through a series of residencies. The collaborators talked, walked in the fields, blogged, built things and shared what they were learning through exhibitions and community events.

So that first terrific road trip was followed by many more in NSW, Queensland and Victoria. And those

eight collaborations became catalysts for countless other discoveries and friendships. Events happened all over the place, from the “city-in-the-country” glamour of Bingara’s spectacular Roxy Theatre (see pages 12–13), to the surreal “farm-in-the-city” experience at a soil-filled Carriageworks in Sydney. The *Artist Farmer Scientist* project generated a multitude of things: games, dinners, theatre, architecture, prototypes and a very deep hole in the ground. It carried us through the final phase of one of the worst droughts in Australia’s history, made unforgettable by the dust-filled tempest survived by courageous punters at the opening night of our major public events *Groundswell* and *Pulse of the Earth* in September 2019. We’re proud to say that *An artist, a farmer and a scientist walk into a bar* encouraged heaps of people from the big smoke and elsewhere to take their own road trips to visit farms and share in our explorations.

This newspaper contains many viewpoints on these encounters, and is presented in two parts: first *Artist Farmer Scientist*, which explores the processes and discoveries of the eight collaborative projects; followed by *Groundswell and Beyond*, which draws together the ideas of some of the inspiring speakers at *Groundswell* and *Pulse of the Earth*. Many of the articles were written in the heat of the moment, as artists reported their immediate experiences through the KSCA blog. Others are more retrospective, or pick up tantalising threads and head off in brand new directions. Some are scientific, many are agricultural. There are also poems and philosophical reflections. And sometimes, we just let the pictures do the talking.

To take a deeper dive into the project, and to learn more about Kandos School of Cultural Adaptation, visit www.ksca.land

Mother's little helpers

KARLA DICKENS

For Artist Farmer Scientist, Karla Dickens worked with Indigenous historian and agriculturalist Bruce Pascoe, Blacklock Media and Aboriginal children from Bingara Central School. She created a poetic short film called Mother's Little Helpers, which features Pascoe and the children walking through Gamilaaraay Country wearing exquisite hand-embroidered capes. The poem reproduced here accompanies the project, which also comprises a suite of limited edition inkjet prints, and was exhibited at Linden New Art in Naarm Melbourne in 2020.

The deathbed rattles
reality has arrived
with an offbeat heart
her veins die

Thirsty and hungry
no shelter to hide
screaming and crying
as water levels rise

No coloured pills
for mother today
overdosing on crooked Band-aids
shakes from withdrawal stay

Battered and bruised
sweating in pain
the time has come
to nurse her back

Too late for flowers
hold her hand
hug her tight
love her through long, dark nights

Sleepless chaos
no more fight
I see you, I hear you
I stand to fight

As mother recovers
looking unsure
and drained
she feels connection

Not blissfully
but respectfully
a world where humans
are brave enough to listen

An environment
that builds
trust in survival
where money is not the hero

Another realm
without excuses
hate or cunning
or self searching gain

Stay crazy for a minute longer
imagine a sustainable future
your heart full of hope
and an openness to learn

Where governments
and those in power
make change
with a sense of intelligence
and childish wonder

Let's keep tripping

Act now



Karla Dickens is a Lismore-based Wiradjuri woman who works with collage, assemblage, installation and painting, exploring the complexity of Australian history

and contemporary Aboriginal experience. An award-winning artist, her work recently featured in *NIRIN*, the 2020 Biennale of Sydney.



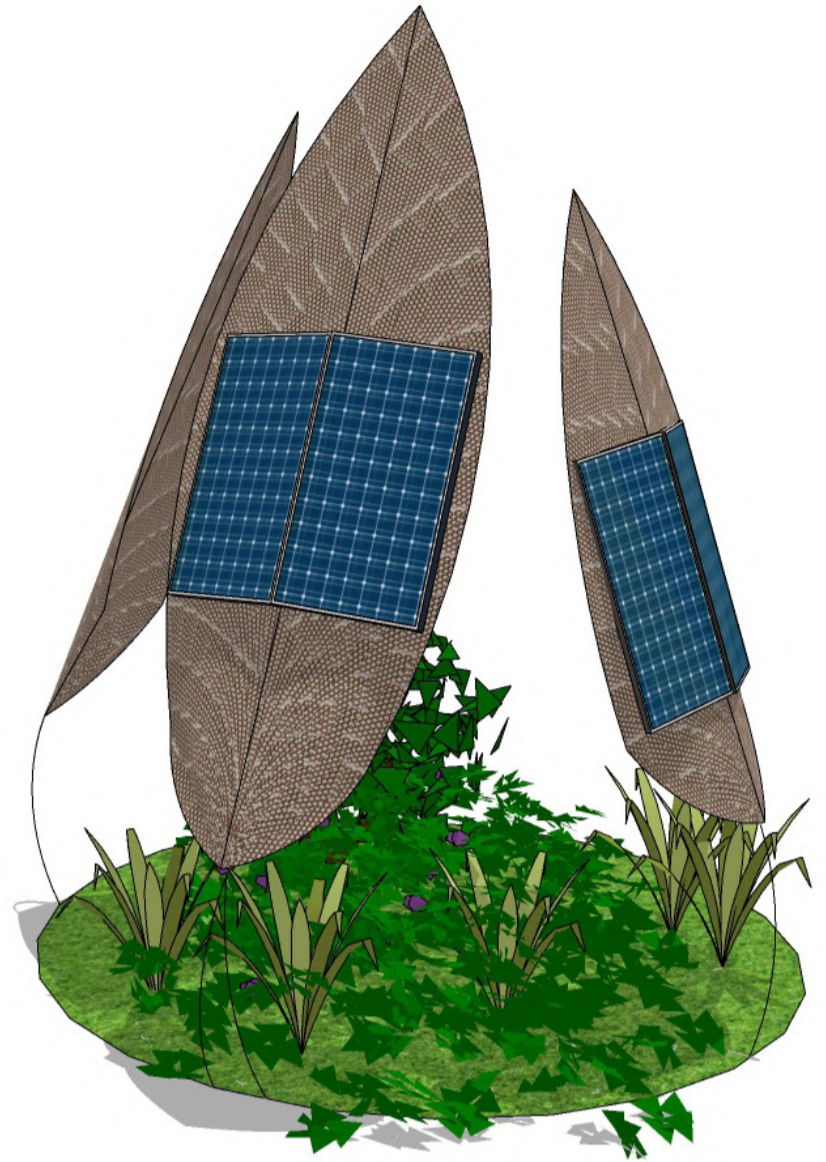


Karla Dickens, *Mother's little helpers IV* (detail), 2019, Inkjet print, 67 × 120 cm. Image courtesy of the artist and Andrew Baker Art Dealer.

An unlikely collaboration redefines physicist's approach to climate

BJORN STURMBERG

In this essay, scientist Bjorn SturMBERG reflects on his two-year collaboration with farmers Erika Watson and Hayden Druce, and artist Mark Swartz. This piece was originally published in the Australian science journal Cosmos on 9 December 2019.



Mark Swartz: 'Solar Leaves' (2020).

We generally hear climate change discussed as a technical challenge that will be solved with bigger wind turbines, more electric cars, less steak and fewer flights. The mission is nothing more, and nothing less, than to reduce the emissions of carbon dioxide equivalent units.

As a physicist, this computes for me, but over the past year, I've begun to look at things differently.

I'm part of *An artist, a farmer and a scientist walk into a bar*, an unusual arts initiative in Australia designed to challenge and change the relationships we have with the land. My project—one of eight— involves working with a sculptor and two horticulturists to explore creative ways of harnessing solar energy on farms.

Things began with a visit to a drought-stricken farm in the shadows of the Blue Mountains escarpment west of Sydney, where I became aware of the shallowness of the simplistic technical response to climate change.

Then, as the project involved me in more conversations with artists and other collaborators, a number of things struck me.

The first was the attentiveness and genuine value placed on the artistic process. You can hear this whenever an artist refers to their "art practice" instead of their "art". This seems to me to be powerfully linked to artists' comfort in constantly working with a blank page; with a loose scope; with uncertainty.

Farmers too are deeply embedded in a perpetual process of tending to their living, breathing, never static landscapes.

As we rush into our uncertain future—with its changing climate, changing technologies, and changing demographics—the rest of us (especially us science types) would do well to give greater attention to the processes we adopt when we engage with issues.

I don't identify as an artist, so I felt free to stumble across the curious, creative terrain of sculpture without any preconceptions

Appreciating the process keeps us focussed on continually asking good questions and pursuing best possible solutions. It also helps sustain motivation through our multi-year challenges.

The adjustment in perspective is nicely embodied in the use of verbs over nouns: of consulting instead of ticking off a consultation, of leading instead of being a leader, of refining one's art/farming/science practice instead of being defined by one output.

The second remarkable aspect of the collaboration was how the context of an art project opened up a uniquely non-judgmental space. I put this down to a mix of identity and culture.

I don't identify as an artist, and so masquerading in that role I felt free to stumble across the curious, creative terrain of sculpture development without any preconceptions.

Beyond this though, I believe we have a shared cultural perception that in art there aren't any right or wrong ideas (although we all claim the right to like some art over others). This art setting was a radical contrast to the pressurised air of typical expert forums.

In developing our project, the combined effect of embracing the process and an open atmosphere freed us to derive things from first principles: our values. In this setting, the prominent values included the health and resilience of landscapes, the nutrient density of the produce, the relationships connecting humans to each other and their environment, and the future we will bequeath to our children.

Having uncovered these values we could build a shared understanding of the true meaning of the farmer's integrated farming system, and a vision of how to communicate this through sculpture.

This, I now believe, is also what must happen for us to successfully engage with the adaptive challenge of climate change: rather than simply being an enormous technical challenge, climate change is also a cultural one. To successfully respond, we must start by identifying and articulating our values.

Only with these in the open can we undertake the necessary work of managing change, starting with honest discussions of what—what things, what values, what structures—we're collectively committed to holding on to throughout the changes, what we're hoping to gain, and what we're willing to let go of in the process.

A year on from that first weekend on the farm the influences of the project on me remain strong: embrace the process, particularly in the midst of long and uncertain projects, and keep spaces open for discussing values.

These attitudes are essential for the effectiveness and sustainability of our pursuits in a world bursting with change. Let us embrace further art collaborations to illustrate and instill them.



Dr Bjorn SturMBERG is a Research Leader in the Battery Storage and Grid Integration Program at The Australian National University where he works on research & development of low carbon electricity and transport systems. He previously led SunTenants, which makes solar work for rentals, and initiated the first installation of solar + storage in an Australian apartment.

...While the sun shines

ERIKA WATSON

The old saying “make hay while the sun shines” evokes a brilliant field of tall golden grass. The mind wanders into romanticism and images of Van Gogh’s farmers bent over with scythes, earning an honest living off the land. Don’t get me wrong, there are also waves of realism in my mind: Van Gogh’s peasants had large families, and died young. The work was back-breaking, generating a meagre income and while they were probably making hay for the feudal Lord, the workers went mad eating mouldy grain or simply went hungry. But, beyond all this suffering, there remains something beautiful to me about the way the cyclical rhythm of the seasons shaped human labour.

These days, haymaking involves GPS-driven heavy machinery, baling up and hauling out. It’s less back-breaking, and people live longer lives (heck, the farming population is actually ageing!). Lords have been replaced by corporations, and villages have been replaced by export markets. The land and all its resources are there to serve the needs of an insatiable human population. But with all that modern living provides, humans have become disconnected from each other and divorced from the natural processes that sustain us, as our different knowledge systems become increasingly segregated.

Over the last two years, Hayden and I have been involved in *An Artist, a Farmer and a Scientist walk into a bar*, blending

ideas with artist Mark Swartz and solar scientist Bjorn Sturmberg. We have been privileged to cross boundaries, share ideas and ultimately come together to collectively create an artwork with beauty, purpose and function. Even in our short seven years of farming we have seen the rhythms of the seasons grow increasingly erratic and extreme. The concepts informing the solar artwork we created emerged in a time of severe drought, when we had a dire need for water—when the sun shines on and on but hay is hard to make. As a result, our project focused on the farming landscape as an integrated whole, considering all the natural processes that sustain life.

We want the actions we take on the farm to be accountable to the ecological cycles we all rely upon

Our sculpture expresses the interconnected quality of nature’s cycles—solar energy, minerals, water and biodiversity. But it also appeals to our desire for something useful. It acts as shade covering the ground and supporting understory plants. It harvests sunlight energy, and it uses that energy to move water to places that otherwise could not have been passively irrigated. It behaves like a tree. This reflects how we try to farm at Bula Mirri.

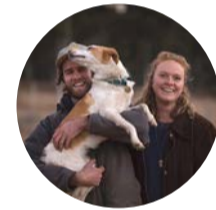
Here’s an example of how we have attempted this balancing act at Bula Mirri, and this connects with the development of our collaborative sculpture. With the changing climate, we now experience fewer and more extreme rainfall events. When the rain comes, it falls evenly across the farm, but quickly runs off and is lost to us. So we created a dam following the principles of P.A. Yeomans’ Keyline Design. This dam has been placed as high as possible on the farm to catch and store water and move it around the property. The design uses gravity to hydrate the landscape where and when it’s most needed.

We have chosen to place the sculpture

will also aid in the establishment of plants on a ridge that has shallow soil, so that along with water and sunlight it will help us to increase organic matter content, water holding capacity, biodiversity and ultimately soil and farm health.

We love that the creative collaboration and assembly of this artwork demonstrates the farming philosophy we have for Bula Mirri. It reflects humanity’s connection to natural ecosystem function, and participates in the balancing act we maintain to keep all the cycles working in the most generative way possible for all living things.

May the sun keep shining.



Erika Watson and Hayden Druce, owners of Epicurean Harvest, grow organic vegetables at Bula Mirri, their farm in Hartley, NSW. They are dedicated to regenerative and collaborative practices to connect people with land, provenance, culture and food. They both studied Horticultural Science and Holistic Management and have backgrounds in art and music.



Bjorn Sturmberg, Erika Watson, Mark Swartz and Hayden Druce at Bula Mirri Farm, 2020. Photo: Justin Hewitson

Harvesting sunshine

MARK SWARTZ



The collaboration between Erika Watson, Hayden Druce (farmers), Bjorn Sturmberg (scientist) and myself (artist) began by asking how we could combine our expertise to pursue a common goal. The conversation quickly turned to how electricity production might be incorporated into holistic farming practices in a practical and beautiful way.

Over the course of two years, our focus changed many times. Our ideas ranged from roving electric vehicles to systems that recorded minute changes in the environment, to a kinetic evaporation capture structure over the dam.

The creative vision of the group remained strong, generating exciting ruptures in the artist, farmer and scientist stereotypes. Hayden and Erika managed to shift seamlessly between being creative visionaries and realist, drought-affected farmers. Bjorn, the scientist, was often unable to accept ideas that contained unachievable details, and yet was the first to suggest most of them. And I, as the artist, was constantly conflicted about what was most interesting conceptually and what was practical within our budget, time

and material constraints.

After many nice cups of tea and hundreds of ideas the parameters began to narrow. The focus turned to inventing a farm system that would allow plants and solar panels to share the sun's resources. Photovoltaics and photosynthesis in symbiosis! We imagined the panels could assist plants by powering water pumps, relaying information to the farmers and shading the plants from the direct rays of midsummer. Of course the system also needed to be beautiful and to contribute to a farm that was already a creative place full of innovation.

allows for the effective and efficient capture and storage of water, so that it can later be used to hydrate the landscape when it is dry.

In the end our team developed a small sculpture that captures the sun's energy and rainfall, and pumps water from the new Keyline dam to a small area of the property missed by the Keyline system. The sculpture shades and protects the land below and around it. The pumped water may one day be distributed through a small scale model of the farm's Keyline system that Erika and Hayden would like to create to demonstrate the value of Keyline

up to support the power requirements of the whole farm, and how such a piece of artistic infrastructure could be integrated with a holistic farming vision.



Mark Swartz is an artist who explores the connections between organic and industrial materials. He has received several awards, including first prize at *Harbour Sculpture* 2014 and the *Australian Bamboo Sculpture* prize in 2015. Mark is also the founder of Feather Edge, which sees him project managing and fabricating large-scale creative projects.

The sculpture captures the sun's energy and rainfall, pumps water from the dam, and shades the land around it

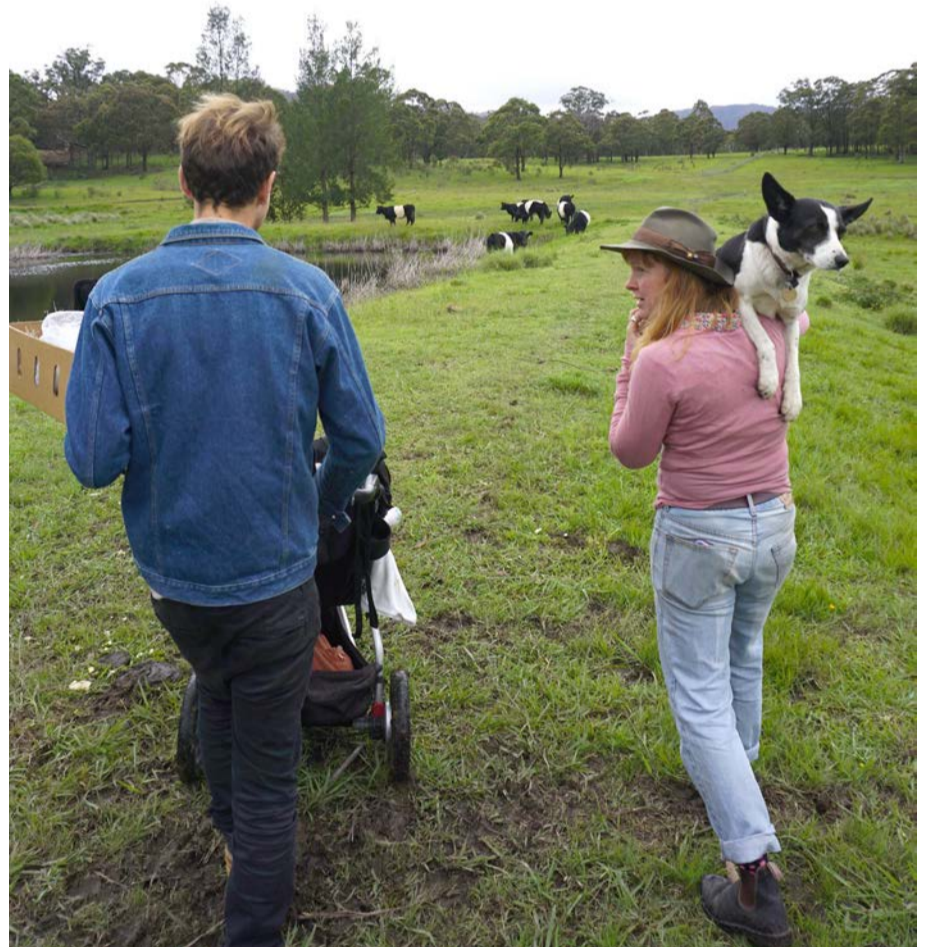
Throughout the project Erika and Hayden were simultaneously sculpting their property in accordance with P.A. Yeomans' Keyline Design. This system

farming to others.

This first sculpture is intended to be a prototype and educational tool. It suggests what is possible if this concept were scaled



TOP: Installing the prototype at Bula Mirri Farm, 2020. Photo: Laura Fisher. BOTTOM: Digital sketch showing the concept of a photovoltaic canopy in the market garden.



TOP: "I'm walking on sunshine" panel discussion at *Groundswell*, 2019. Photo: Vickie Zhang. From left: Lucas Ihlein, Mark Swartz, Hayden Druce, Erika Watson with baby Juniper, Bjorn Sturmberg and Georgie Pollard. LEFT: Scenes from "KSCA's Art and Farming Picnic with Epicurean Harvest", a public event staged in association with the Artbank exhibition *Uncertain Territory* (2019). RIGHT: At Bula Mirri Farm. Photo: Laura Fisher.

The Living Classroom in Bingara

RICK HUTTON

One of the big outcomes of the Artist Farmer Scientist project has been the development of a “sister-city” relationship between Kandos and Bingara. So much of this relationship has hinged on The Living Classroom in Bingara. Here, The Living Classroom’s manager Rick Hutton gives an overview of the array of projects continually evolving at this dynamic community-run land education hub.

As The Living Classroom (TLC) celebrates ten years since construction began, it is important to review what it is, what it does, and what its future will be.

Built on 150 hectares of what was degraded town common land, TLC was the vision of Gwydir Shire Council and Bingara and District Vision 2020, a group of passionate community members who came together in 2005 to develop strategies for the town and region to thrive. TLC’s goal was to provide a place to showcase land-use options for the 21st century. It presented itself as The Australian Centre for Regenerative Agriculture and adopted the theme of “regeneration” at a time when “sustainability” was the focus of most like-minded projects.

Vision 2020 identified four growth

pillars for the town and district going into the 21st century: future agriculture (i.e. non-conventional farming), tourism, education, and regional conferencing. Gwydir Shire Council and Vision 2020 had initially partnered with Queensland University of Technology (QUT), the Murray-Darling Basin Authority, and the state and federal Departments of Education and Tourism to finance and develop projects focused on the regeneration theme. More recently, TLC formed a partnership with Kandos School of Cultural Adaptation (KCSA) focused on artistic and cultural collaborations for environmental transformation.

Bush-Tucker Garden), ‘Paradise Found’ (the Mediterranean Garden), the ‘Mandala Kitchen Garden’ (created in collaboration with Bingara Central School), and ‘The Carbon Farm’.

More recent projects have included *An artist, a farmer and a scientist walk into a bar* with KSCA, the ‘Tiger Pear / Cactoblastis Nursery’ with Northern Slopes Landcare Association, and the *Pulse of the Earth* festival in collaboration with Vision 2020 and KSCA. Currently in development is an exciting collaboration with the new Regenerative Agriculture Department at Southern Cross University in Lismore.

world food within the ‘virtual museum’ and demonstrate fresh and processed food options.

The ‘A-Mazing Veggie Garden’ will be an 800 square metre raised vegetable garden forming a maze / labyrinth of ready-to-pick seasonal foods, the Spiral Hill and Hollow will be a fun-themed landscape feature between the Mediterranean Garden and the Chain of Ponds, and the Leaky Dam will be a storage for excess water within the Aussie Farm Dam water capture and storage system.

There are many more projects on the horizon: STEM based projects for secondary schools with a series of filmed documentaries, planning for a second *Pulse of the Earth* festival, the Livestock Barn cattle rearing centre with Bingara Central School and a collaboration with The University of Sydney’s I.A. Watson Grains Research Centre in Narrabri focused on native grasses and Indigenous food systems.

There are so many positive developments, despite a background of terrible events and environmental pressures. I am excited to see TLC evolve as an oasis of optimism and opportunity, in this amazing place and in these ever-changing times.

The Living Classroom showcases regenerative land-use options for the 21st century

The first tranche of funding constructed the Classroom, the Bunkhouse, the Workshop, the Nursery and the five kilometres of banks and swales, and fourteen dams, lakes and ponds.

Subsequent funding and community engagements have led to the finessing of the landscape into plant-based ‘storyboards’ depicting various geographic and cultural landscapes. These include The ‘Aussie Farm Dam Makeover’, ‘Nourish’ (the

With the support of a NSW Regional Tourism Grant, a project titled ‘Big River Dreaming’ will expand upon the ‘Weaving Water Way’ concept developed by QUT Landscape Architecture students. An Interpretive Centre and Common Room will be constructed immediately east of the Bunkhouse. This will provide a storytelling centre and archive featuring the development of TLC, the prospects of regenerative agriculture, and the stories of



Rick Hutton in the pumpkin patch at the Living Classroom.



TOP: The Living Classroom, annotated by Rick Hutton. Drone image: Scott Crispin, November 2020. BOTTOM: Bingara Central School students visiting the nursery. Photo: Scott Crispin.



Rick Hutton is the current Manager of The Living Classroom in Bingara NSW. He has been a teacher of geography and economics and a retailer. Rick is passionate about The Living Classroom and the opportunities it presents to Bingara, to Gwydir Shire and to the planet.

A serious comedy in one act

NORTH WEST THEATRE COMPANY

"In every true artist, or farmer, or scientist there is a spark, as precious as that first tiny spark with which life itself began..."
 – Farmer/Conservationist Louis Bromfield, 1951

Sparks flew when Rick Hutton, from The Living Classroom proposed that the North West Theatre Company stage a play for the local community, inspired by our project name. Rick's vision was to use Bingara's dazzling Roxy Theatre to dramatise the skylarks and pitfalls of artist-farmer-scientist collaborations. Dinner and a show? What a rollicking good idea!

An artist, a farmer and a scientist walk into a bar: The Play was complemented by a locavore's feast fit for both carnivore and herbivore. Wildfood guru and KSCA artist Diego Bonetto (see pages 22–23)

and stylist Marnee Fox, assisted by KSCA's Leanne Thompson developed a menu with local community organisation Friends of Touriandi. While cautious at first, these intrepid ladies took the plunge and incorporated weeds into each delicious dish: nettle focaccia, cumbungi and sowthistle slaw, saltbush chips, roasted pumpkin and sauteed dandelion salad, as well as a scrumptious sow thistle and mallow salsa verde. Farmer Glenn Morris of Figtree Organic Farms helped to feed the multitudes with organic grass-fed pork and beef. Many of the artists and collaborators

were on hand at this gala event, to share their dreams and schemes with the audience.

With thanks to the amazing cast: Johnette Walker, who played Ms Phillipa Glass (the Bartender), Linda McDouall, who played Ms Esme de l'Orange (the Artist), Therese Green, who played Dr Therese Green (the Scientist), Garry McDouall, who played Arthur Farmer (The Farmer) and Rick Hutton, playing Jock McTavish (the Silly Scotsman).





The North West Theatre Company presents ...

"Grass up to their elbows!"
- The Dirt

"Outstanding in their field"
- Young Stars

"A worm's eye view of life!"
- Grass Roots

"I laughed until the tears ran down my leg!"
- Soiled Shorts

"A quirky romp, from the knee bone, to the T-Bone, and on to the funny bone!"
- The Butcher's Hook

An original play to launch 15 months of arts.

A feast of organic meats and 'wild food' vegetarian treats!

\$50 per person for show and three course dinner. BYOC.

7:00 pm Saturday, May 5
ROXY THEATRE, Bingara

Bookings 67240066 or
www.roxybingara.com.au/category/whats-on/

AN ARTIST, A FARMER & A SCIENTIST WALK INTO A BAR...



Falling in love with carbon

GEORGIE POLLARD

This article was originally published on the KSCA blog in September 2018.

Of late, I've become obsessed with carbon dioxide and climate change. Too much carbon dioxide. How are we going to get that stuff out of the atmosphere and back into the ground? Googling carbon sequestration brings up numerous methods that people are developing to capture carbon and one of those methods is biochar.

I was very lucky to be invited by Ruy Anaya de la Rosa and Adam Blakester to create an artwork about biochar to be exhibited at the Australia New Zealand 2018 Biochar Conference in Tweed Heads. I was at the conference for three days, surrounded by scientists, farmers, engineers, entrepreneurs, academics and bureaucrats who are all working within similar parameters, but with a diverse range of strategies and goals. I left the experience with my head in a spin and I'm hoping that writing here will help me untangle some of the amazing threads I was given.

I started on this journey with a very simple idea. Ruy, Adam and I discussed how we wanted an artwork that would be a simple representation of the main objective of Biochar 4 Sustainable Soils: to sequester carbon whilst improving the condition of depleted soils by using biochar.¹ I came up with *The Long Sleep*, an artwork devised in response to biochar as a method of carbon sequestration as well as a means of improving the ability of soils to hold water and nutrients. My artist statement reads:

It is an old oak double bed that has been charred in order to preserve and protect it. Within the frame is a bed of biochar, in which life is growing. Wooden household objects such as bowls, cups and toys are charred and lie on top of the bed, nestled in the plant life.

In a similar way to how fossil fuels are extracted from a reservoir of biological life that is burnt in an instant, these objects have a history that looks to have been destroyed. But wood that has been charred like this has actually been preserved. These objects are now a form of carbon that is stable and can last hundreds of years in the soil, not only sequestering carbon but also increasing the fertility of the land. Once upon a time, these objects participated in the life that surrounded them. A toy train was played with, a chair sat on. Now, through the process of biochar, we've put the carbon to bed, sequestering and preserving these objects for their long sleep.

When I first partnered with Ruy and

Adam to create work around biochar it was a difficult concept to come to terms with. If there is too much carbon dioxide in the atmosphere how can burning stuff be thought of as a solution? There was an initial abhorrence and fear around burning and watching smoke rise and contribute to climate disaster. But carbon is complex and the production of biochar is a counter-intuitive approach to storing carbon.

Carbon is an amazing building block of life, it has four electron bonds that connect readily to other carbon atoms as well as many other elements, particularly two common elements, oxygen and hydrogen. In the case of methane, the four potential electron bonds available to carbon are taken up by four hydrogen atoms. Cellulose is the arrangement and bonding of carbon, oxygen and hydrogen. In my mind, I see a soup of elements floating around, ready to attach in different ways and create different substances. We all know a water molecule is two hydrogen atoms with one oxygen (H₂O) but add carbon atoms and you've got carbohydrates. Add nitrogen atoms to the mix and proteins can be formed, making muscle tissue. A few oxygen atoms together with a carbon and a calcium atom make limestone. I'm not a scientist and so this stuff feels magical to me.

The geological timescale that is the long-term carbon cycle is indifferent to the mortals crawling on its crust

Within the bonds between atoms that make up molecules energy is stored. So the breaking of bonds is necessary too. It's the usual story, a crazy cycle of creation and destruction. Life builds using these basic building blocks, adding a random element here and there for diversity, fun and beauty. But then some other form of life comes in and eats it, or destroys it in some way, releasing the energy that is necessary for life. Maybe fire rips through forests or perhaps numerous volcanoes erupt and mass extinctions follow. All random-composition and decomposition.

The narrative thread I want to pull out of this random swirling of bonding and breaking down of atoms is the relationship of carbon to climate change. Carbon feels like the antagonist in the climate change disaster story as we race to get excess carbon out of the atmosphere and into the ground. Carbon however, has its own

journey around the planet that can be defined in two different timescales. The short-term carbon cycle is comprehensible on a human scale, the growth of trees, the lifetime of a bird. But the long-term carbon cycle is on a geological timescale, the life of the planet.

How does carbon travel through the short-term carbon cycle? Carbon is pulled out of the air and its relationship to oxygen (CO₂) by photosynthesis, creating organic matter. Whether that leaf is eaten or the sugars go on to build cell walls in the trunk of a tree, one way or another decomposition is a given. Leaves fall to the ground and are decomposed by bacteria or insects. Birds, bacteria, humans or giraffes, we all produce carbon dioxide (CO₂) and methane (CH₄) as we participate in that process of decomposition. Your compost heap, your backyard worm farm, your breath. You are connected to that carbon cycle. Stand next to a tree, breathe in the oxygen it creates. Breathe out carbon dioxide, the tree loves you as you exchange carbon dioxide for oxygen in this short-term carbon cycle.

The tree may love you, but the planet couldn't care less. The geological timescale that is the long-term carbon cycle is indifferent to the mortals crawling on its crust. Mountains rise and fall, volcanoes and

production of greenhouse gases within the short-term carbon cycle, but it's our interaction with the long-term carbon cycle that is producing global warming. A tree can live for 50 years or maybe a couple of thousand years, but fossil fuels were laid down around 300 million years ago and we are burning them in an instant. It is the incommensurability of these time scales that is warming the planet and it's ridiculously unsustainable. It's most likely that all of the mass extinctions have had a relationship with carbon dioxide one way or the other, either too much CO₂ heating the planet, or too little creating the ice age.

It doesn't take much to become overwhelmed by the immensity of this problem. But at the Biochar Conference, it was heartening to sit amongst people who were tackling this issue, looking for solutions to our reliance on fossil fuels. Coal isn't just about energy production. In order to make solar panels and wind farms we need steel and steel-making requires coal. Food production relies heavily on fossil fuels to make fertilisers. We need to get carbon back into the ground in a stable form. Biochar sits within these problems and more.

This work and Biochar for Sustainable Soils (BASS) was funded by the Global Environment Facility, implemented by the United Nations Environment and coordinated by Starfish Initiatives.

1. See www.biochar.international



Georgie Pollard is an artist living and working in Kandos NSW. She is interested in how art functions and uses diverse media to explore how art might intervene and generate ideas, reflection and new relationships within communities.



Georgie Pollard's *The Long Sleep* displayed at the 2018 Australia New Zealand Biochar Conference in Tweed Heads.

Uncertain territory

RICK HUTTON
GEORGIE POLLARD &
IMOGEN DIXON-SMITH



In early 2019, Georgie Pollard was invited to participate in the exhibition *Uncertain Territory* at Artbank in Sydney. The show's curator, artist Halinka Orszulok, selected work that explored how landscapes are always overlaid with many meanings and histories. Halinka was interested in the way KSCA was bringing art into the farming landscape, and Georgie's work *The Long Sleep* (see page 14 of this newspaper) was selected for the show.

As Georgie prepared to transport her artwork from Bingara, Artbank raised concerns about the organic life it might be harbouring. Wasn't there a risk that insects would find their way into other regions of the Artbank building, where countless valuable artworks owned by the government are stored? A fascinating email conversation followed between Rick Hutton (who manages The Living Classroom), Imogen Dixon-Smith (Assistant Curator at Artbank) and Georgie. The conversation had extra gravity because *The Long Sleep* was the first artwork to have been commissioned and acquired for The Living Classroom.

Georgie to Rick, 8 Feb 2019

Hi Rick,
What is unfortunate now is that they [Artbank] want to spray the bed with something that will kill any bugs that might be in the bed. Because they house and preserve artworks, they can't have anything that might eat or damage anything. I'm assuming that while the spray won't damage the plants, it will probably kill off any microbial life. I'll ask them what the spray is called and get back to you. Had I known that I might have insisted that we go with a different artwork. I'm so sad about using pesticides on the bed! It is the irony of exhibiting in an institution. That living things don't really fit.

Thank you and Garry and Lee so much for all your help the other day. It was so wonderful to hang out in Bingara for that short time.

Talk again soon
George.

Rick to Georgie, 8 Feb 2019

Thanks Georgie.

The spray thing is absurd.

Who is your contact for that? I will write to them with a little science logic.

Georgie to Rick, 8 Feb 2019

Great idea Rick,

We should ask them first what the pesticide is that they want to spray.

I would contact Imogen (who sent you the loan agreement) and ask her who to speak to.

But make sure you CC in Laura and Ian and I in the exchange. It might mean that the bed doesn't end up in the show, or some other compromise reached. But the relationship between the art institution and The Living Classroom (omg the irony!!) is going to be very important as a learning tool for everyone involved. And if you

think of it as a reflection on regenerative agriculture, it's a perfect mirror to the same institutions and processes.

So please make sure we can see the conversation. It will contribute to further artworks!

Rick to Georgie,
8 Feb 2019

It may be just an automatic gallery response without consideration of the art's specifics.

Can they present it outside? A natural quarantine?

I would hate *The Long Sleep* to become a quick death. If it IS full of pesticides I would be reluctant to see it back at TLC. 😞

Rick to Imogen at Arbank,
8 Feb 2019

Hello Imogen,

Artist Georgie Pollard has told me that Artbank intends to treat (spray) her work of art *The Long Sleep* on loan from The Living Classroom, with an insecticide.

I strongly protest against this.

The Long Sleep depicts the recycling power of nature. The whole purpose of the work is to show how nature responds, restores and renews. The carbonised bed and the household items on it, are undergoing a state of change, a metamorphosis. They are accommodating and assisting green plants, fungi and microbes to convert the familiar items back to the earth from whence they came. In the fullness of time the recycling will be complete. We get to see the process as a living work of art.

I am sure that you and your public will love the way that life is portrayed in the work. Just in the last week we have seen a multitude of fungi emerge within the bed, a very rapid change within an otherwise slow and gradual natural carbon cycle (see picture attached).

Here at The Living Classroom we are BIOCIDE FREE. We showcase the growing of food without the use of pesticides, herbicides or fungicides.

Please do not add anything other than some warmth, filtered sunlight and gentle fresh water, preferably rainwater, onto, or immediately around *The Long Sleep*.

I can suggest options for you to consider if you are obliged to provide some form of 'treatment'.

Thank you for your consideration.

Regards,
Rick Hutton

Imogen at Artbank to Rick,
8 Feb 2019

Dear Rick,

Thank you for your email. I completely understand your concerns and Artbank certainly does not want to undermine the work in any way.

Artbank's collection of artworks is stored onsite, next to the gallery. This makes bringing in organic matter quite high risk as most plants carry small insects such as carpet beetles. If these insects infect our collection of artworks they can cause irreparable and costly damage. Our Registration team has proposed we spray the artwork with a substance that I have been assured does not kill any of the plant matter.... They have told me it is organic, however it is beyond my knowledge so it would be best to talk it through with them. If we are unable to treat the bed then the artworks' inclusion in our exhibition will need to be reconsidered because the risk of damage to our collection is too high.

I apologise for any misunderstanding... we do not want to undermine the work in any way, however we do need to take these considerations seriously given the high value collection onsite that is the basis of our operations here at Artbank.

Thank you for raising this issue and I hope we can resolve it to the satisfaction of every party. Many thanks, Imogen

Rick to Georgie and others,
8 Feb 2019

I am replying to All except Imogen at Artbank at this time.

Sadly it seems that she does not quite understand how an ecosystem works. I would think it unlikely that *The Long Sleep* will harbour carpet beetles as it is equally unlikely that their pesticide will act specifically on it.

Maybe if they get back to us and explain exactly what it is they do and use we might get a compromise.

I think Georgie has the most to lose if we persist with NO treatments at all.

Do we just grin and bear (bare) it?

Georgie to Rick and others,
8 Feb 2019

Hi Rick,
I'm thinking we hear what the stuff is that they spray, if it is organic and you would know something about the spray then it's fine if you think it's ok. If it's going to kill the fungi and microbes we might have to think of something else.

Having thought about quarantine, I wondered how would we do that and how

long would it take? We don't have much more than a week.

Ian has wondered if spraying around the bed would work? And Lucas has suggested the work being off site at Big Fag Press.

Don't worry about me, it was a hassle if it's not going to be in the show, but not a big deal. I think what is going in here is interesting. It's definitely all about regenerative agriculture to talk about pesticides and killing stuff in order to grow stuff. If we frame this well we are talking about the clash of these two cultures.

I totally understand where they are coming from. We just need to negotiate that boundary and in doing so we create another layer to the work.

The irony of exhibiting a living artwork in an institution is that living things don't really fit

Rick to Georgie and others,
9 Feb 2019

We will wait to see what Artbank decides about 'treating' *The Long Sleep* with pesticides before it goes on exhibition in Sydney.

But, in the spirit of our collaboration with *An Artist, a Farmer and a Scientist walk into a bar* this development does raise an issue worth some consideration and debate I think.

I came across the following quote by a well known artist and a commentary by John-Paul Stonard:

Through art we express our conception of what nature is not.—Pablo Picasso, 1923

Picasso was right. No matter how naturalistic a work of art, it is always more about art than nature. Works of art show our sense of being apart from the natural world, our stubborn sense of difference from other animals and the universe in which we find ourselves.¹

I think that with *The Long Sleep* artist Georgie Pollard has gone beyond that opinion.

Will 'our stubborn sense of difference' have us not see nature as a teacher, a healer

and a reminder of who and what we are?

Congratulations Georgie. I think your work of art transcends this narrow view.

Are we brave enough on our little jewel of a planet to respect nature and to trust 'her' to set things right?

Rick Hutton

Imogen to Rick, 11 Feb, 2019

Hi Rick,
I have consulted with our Registration team and they are happy for us to take the risk now that the bed is displayed in the foyer of our building, quite isolated from the collection store. We will monitor the bed over the first week and if we notice any

insect activity that concerns us, we will get in contact with you to discuss some of the options you mentioned in your previous email that you would be happy for us to use.

Thank you for getting in touch with your concerns, it is important to us that the integrity of the work is preserved and we are looking forward to seeing how it evolves in the new environment here in Sydney over the coming months.

Kind regards,
Imogen

Rick to Imogen, 11 Feb 2019

Thank you Imogen

That is a generous spirit and much appreciated by us all.

Rick

Georgie to Imogen and others,
11 Feb 2019

Wow Imogen!

Thank you so much for advocating on our behalf. It is most appreciated.

Wonderful news.

George

1. John-Paul Stonard "Art and Nature" in *Tate Etc.* Issue 43, Summer 2018. www.tate.org.uk/tate-etc/issue-43-summer-2018/opinion-art-nature



OPPOSITE: *The Long Sleep* sprouting fungi, September 2019. Photo: Rick Hutton. ABOVE: *The Long Sleep* installed at The Living Classroom.

An artist, a farmer and a scientist walk into a bar... and learn about biochar

RUY ANAYA DE LA ROSA

Scientist Ruy Anaya de la Rosa worked with KSCA's Georgie Pollard, and Adam Blakester from Starfish Initiatives on a collaborative project investigating biochar. In this article, Ruy outlines the significance of biochar for mitigating climate change, and suggests a role for artists in amplifying public education around complex science.

Maintaining soil health is vital for improving food security, reducing poverty and preventing conflict. Biochar systems can improve soil function and remove atmospheric carbon dioxide safely. At that same time, they provide numerous environmental, economic and social co-benefits resulting from improved management of biomass resources, water and pollution. In 2018, the Intergovernmental Panel on Climate Change (IPCC) included biochar for the first time as a key negative emission technology required to complement greenhouse gas emission reductions and bring the excessive amount of atmospheric CO₂ down to safe levels.

Funded by the Global Environment Facility and UN Environment, and coordinated by Australian charity Starfish Initiatives, the Biochar for Sustainable Soils (B4SS) project trained over 600 people in the production and use of biochars in China, Ethiopia, Indonesia, Kenya, Peru and Vietnam.¹ Across these six countries average crop yields increased by 10–15%, and the use of synthetic fertiliser was reduced by up to 40% in Ethiopia. I was the Project Director of this initiative.

Biochars are the chars produced from heating organic matter to 300–900°C in oxygen-limited conditions (a process known as pyrolysis), such as those created in soil pits, brick kilns and engineered metal reactors. A growing body of scientific literature shows that biochar systems offer promising potential to upcycle biomass waste, improve soil pH and health, reduce eutrophication² through improved nutrient retention, remediate contaminated soils, generate renewable energy, and mitigate climate change. When biomass residues³ are converted into biochars, the carbon that has been absorbed in their plant tissues is further stabilised and can be sequestered in soils for hundreds of years, effectively

removing atmospheric CO₂. Due to their high porosity and adsorption⁴ capacity, biochars can also be used as filters to retain specific gases, solids and liquids in various environmental applications.

A recent study has quantified the value of different approaches to conserving and restoring soil organic carbon among natural (land-based) solutions to climate change.⁵ Forest conservation, reforestation, and biochar were identified as the three methods with the highest potential to sequester carbon in soils and deliver co-benefits for sustainable development. There is also increasing interest from the agriculture industry in using biochars to improve the production of compost, biogas and feed for livestock.

With biochars, carbon can be sequestered in soils for hundreds of years

Whilst all this has become clear to scientists, we need to create engaging ways to communicate these new findings—accumulated just in the last decade—so that people are familiar with the most promising biochar formulations and their capacity to enhance agricultural production and profitability as well as natural resources. This is vital given that land degradation affects about 24% of land across the planet.

An artist, a farmer and a scientist walk into a bar provided a novel space to translate common lessons from the international B4SS project into an Australian context in Bingara. The “Carbon Science / Carbon Culture” workshops at The Living Classroom (page 34) proved to be a creative and hands-on-learning experience that allowed school children, farmers, scientists, artists and many others

to learn about making biochars from woody waste in a soil pit kiln. It was not difficult for Australian participants to understand the process of pyrolysis; the demonstration confirmed, as in the other six B4SS project countries, that humans are particularly attracted to making and controlling fire. Having our discussions around the fire pit allowed the community to talk and laugh as freely and loudly as they could, while engaging in biochar-making. We learned that it is important to use dry biomass to make biochars in soil pit kilns, otherwise the process tends to be slow and smoky. It is also a great idea to combine wood-derived biochars with animal manure and/or compost to charge them with nutrients and enhance their quality.

The diverse artistic perspectives that the event generated also led to further collaborations, with Georgie Pollard creating a biochar installation called *The Long Sleep*, which was presented at the 2018 Australia/New Zealand Biochar Conference; and Jono Bolitho creating a biochar hologram called *Holochar*, which was displayed with *The Long Sleep* and also at the United Nations Framework Convention on Climate Change (UNFCCC) meeting in Katowice, Poland in 2018.

These activities showed how learning about biochar is more likely to be successful when conducted in a participatory and entertaining way. *An artist, a farmer and a scientist walk into a bar* was fun and effective in sharing knowledge on using biochars for sustainable land management.

Thank you to the artists from the

Kandos School of Cultural Adaptation and Starfish Initiatives for promoting this enjoyable exchange of ideas and biochar practices among the community in Bingara. I believe there is great potential for scaling up similar biochar projects, nationally and globally, to other regions affected by similar conditions.

1. More information about this project can be found at www.biochar.international
2. This is when a body of water contains excessive amounts of minerals and nutrients, which can lead to algal blooms, a loss of oxygen in the water and other negative consequences. It is often caused by the water that runs off farms and into waterways.
3. This is organic material left over after harvests and other agricultural processes (stalks, straw, fruit pits and pruned branches for example).
4. Adsorption is when molecules of liquid or gases adhere to a solid particle, forming a thin film upon its surface.
5. Bossio, D.A., Cook-Patton, S.C., Ellis, P.W. et al. (2020) “The role of soil carbon in natural climate solutions”. *Nature Sustainability* 3, 391–398. www.nature.com/articles/s41893-020-0491-z



Dr Ruy Anaya de la Rosa has 15 years experience in carbon trading and greenhouse gas (GHG) emissions accounting. He is now Carbon Project Associate with Corporate Carbon, one of Australia's top carbon credit traders.



“Carbon Science: Carbon Culture” workshop, The Living Classroom, 2019. Ruy Anaya de la Rosa, Adam Blakester and workshop participants create a batch of biochar.



TOP: "The Grazing Game" at *Cementa* festival, 2019. Photo: Ian Hobbs. BOTTOM: Dr Judi Earl at her farm Glen Orton in Coolatai. Photo: Imogen Semmler.

Farmers in flux

IMOGEN SEMMLER

Imogen Semmler's project Farmers in Flux follows journeys of change towards ecological farming practices that build soil health, improve biodiversity and increase resilience on farms. Over two years she worked with a range of farmers in the New England and North West NSW regions, including Dr Judi Earl, Lisa Daly, Jane Pickard, Ray South, Alex Hunter, and Bob Moylan. Here she recounts her journey through Farmers in Flux.



Bob Moylan at the 20 hectare mixed-stock farm he and Alex Hunter run near Armidale, NSW. The image shows the terrible drought conditions of mid-2019. Photo: Imogen Semmler.

The Wonders of Process

One of the benefits of being a process-based artist is that you experience the joy of the unexpected outcome. The project's focus is the journey itself. It's a journey of instinct that involves following ideas down interesting paths with unknown destinations. This can often lead to dead ends (which can feel risky) but it also opens doors to new ideas and opportunities. For *Farmers in Flux* I planned to document stories about farmers changing to more ecological farming practices with the hope that interesting things might happen along the way. And they did.

The first unplanned outcome was my "Farmer/Scientist Speed Dating" event. In my conversations with various farmers I began to notice that farmers have limited access to scientists and to scientific discourse. This is particularly the case with ecosystem science, which focuses on how our soils and landscapes function. Often the only way for a farmer to connect with science is to attend seminars and presentations laden with powerpoint slides, graphs and tables. I wondered whether I could bring scientists and farmers together in a fun and accessible way. My 'aha' moment came when I was thinking about the large numbers of people who meet one another on speed dating platforms.

I hosted an experimental speed dating event in August 2019 involving the four farmers with whom I had been working and four scientists. Each met for ten minutes: farmer to farmer, farmer to scientist and scientist to scientist. It was the ultimate ice-breaker as people found they had a lot in common (even outside the realms of farming and science). Connections have continued since the event and I hope to run it regularly in the future with the name 'Perfect Patch'!

The second unplanned outcome of my project came about through working with farmer, scientist and educator Dr Judi Earl. Judi has been regenerating her farm in Coolatai using grazing management. She has spent years managing her groundcover and putting everything in place so that the land is in the right condition to increase

diversity and build soil health. However, she is at the mercy of the climate and unexpected financial events. I kept thinking that a game that featured strategy and chance might be the perfect way to tell Judi's story to a wider audience. So Judi and I invented "The Grazing Game", and I presented it at *Cementa* festival in late 2019. It was a most unexpected outcome. I hope to keep developing the idea with Judi as a tool for farmer education.

Deciding to change farming practices is great if you can still farm. But when there is no water, how can you plan for a future?

The Elephant in the Room

When we launched *An artist, a farmer and a scientist walk into a bar* in mid-2018 the drought was taking hold across the New England and North West regions of NSW. By October, as I was putting a callout to farmers to participate in *Farmers in Flux* I remember driving up to Bingara—across a parched landscape—thinking "what if people don't want to talk to me? Maybe all they can think about right now is how the next bill will be paid? Maybe they will be too shy to show me their farm in decline?"

In the end four farmers responded to my call-out, and they were so very generous to let me into their lives. Early on their stories were positive, focusing on changes that they had implemented or hoped to make. As I spent time with them throughout 2019, however, their stories became increasingly sad as the drought worsened. By Spring, Lisa was destocking cattle and starting to hand-feed nutrition supplements. Her family property was hit hard by the Bees Nest bushfire, which led to the death of stock, and damage to land and fencing. Jane and Ray had stopped watering their trees and, as Jane wrote in an email, they were 'waiting for everything to die'. Alex and Bob were watching their landscape turn to dust before their eyes,

trying desperately to hold onto their small herd of cattle and goats. Deciding how to change farming practices is great if you can still farm. But when there is no water, how can you plan for a future? This drought, the worst on record in the region, has been a horrible, gut-wrenching and emotionally draining waiting game.

Then, at Christmas, the rain started to fall. At the time of writing, (the end of February 2020), some parts of the region

have received hundreds of millimetres. Suddenly, when I speak to everyone, there is a sense of hope. But it's a hope tempered by serious lessons. In principle, farming ecologically can build resilient and healthy landscapes, especially by storing more water in the landscape in a drought. However, it's only through the experience of drought that you can learn how your farm might respond, where its thresholds are and what might be done differently. It is through a drought that farmers learn how to adapt, if they are willing. These realisations are subtle, slow and often painful. Yet the future of agriculture depends on farmers like these, who are able to endure, who observe and listen to their landscapes, and who are humbly willing to learn from bad experiences.

Science communication and the power of storytelling

Having almost finished my Honours degree in Ecology at the University of New England, I am slowly emerged into a world of working with farmers and putting my hands in the soil (rather than always being at the keyboard). It feels practical and fulfilling. However, I am so grateful to be scientifically literate and to be able to stay connected to research. The challenge for

me lies in how to communicate the science that I am passionate about to the farmers I work with and the broader public.

Science communication is a far cry from checking if journals have been referenced correctly or using formal, scientific language. Instead I am trying to make science interesting, accessible and easy to understand. I can write colloquially, I can express emotion, and I can tell stories. With a background in the arts and in documentary and radio, I enjoy communicating with audiences and I appreciate the power of storytelling. Storytelling provides us with an opportunity to change the narrative. The world of agriculture is dominated by big industry. Economic interests are often thought to be incompatible with healthy, functional and diverse farming landscapes. This is a narrative that needs to be changed. The case studies gathered on the *Soils for Life* website, and Dr Charles Massy's book *Call of the Reed Warbler* are two powerful examples. Both use storytelling effectively to educate the public about the benefits of ecological agriculture. Stories are like soft diplomacy. They don't judge and don't tell you what is right or wrong. They foster empathy and allow you to step into someone else's shoes.

All in all, my two year journey through *Farmers in Flux* has confirmed my passion for storytelling, science communication and education. It was an unexpected and wonderful experience.



Imogen Semmler is a creative producer, interdisciplinary artist and emerging scientist. She has worked for and collaborated with a range of arts and media organisations in Australia for over 15 years. Imogen has recently completed Honours in Ecology at the University of New England, focusing on soil health and landscape ecology.

Wildfood Store

DIEGO BONETTO



Can you really make money by selling your weeds?

Diego interviewed by Diego

Diego Bonetto is a funny guy, one of those enthusiastic lads that always has a joke to tell.

No surprises, then, when he piped up with a crazy art proposal for a regional festival in Kandos called *Cementa*, back in 2013. Everyone was quite amused and didn't take it that seriously. The proposal revolved around the idea of upselling weeds from local people's backyards and farms, to fancy restaurants in the city. True story.

And would you believe it, five years on, Diego launched *Wildfood Store*, a marketplace for edible wild plants. *Wildfood Store* is a platform where people who have access to edible plants can connect with top level restaurants in Sydney that want foraged wild produce on their menus. Importantly, the platform aims to create economic outcomes for regional communities.

Wildfood Store, once a crazy art proposal, is now in its second year and regularly supplies wild harvested "weeds" to the likes of Archie Rose Distillery, PS40 Bar, Bulletin Place Bar, Kitchen by Mike Restaurant, Coogee Pavilion Bar, Acre Restaurant and more.

It has been a wild ride for Diego and two years on, with lessons learned, he caught up with him to ask how it all came about:

Diego, first tell us who are you and how is it that you know so much about edible weeds?

I grew up in a dairy farm in Northern Italy, and there and then it was still common practice to send the kids out to the fields and forests to collect the seasonal treats. Springtime was about bitter greens, summer was all about berries and autumn was the time for nuts and mushrooms. As kids, that was our job. You got taught what to look for and off you went to collect edible weeds, as part of the seasonal chores.

When I moved to Australia, I rediscovered foraging, and began teaching others. Now it's my full time occupation

When I moved to Australia as a young man I found out that many of the plants I knew also live here. I started again to forage in my surroundings, and that led me to teach others how to do it. Now this is my full time occupation. I became a foraging instructor.

How did you come up with the idea of starting a marketplace for weeds?

When I teach people how to identify edible plants in the landscape, a big portion of my students are chefs and people working in the hospitality industry. They are interested in new flavours and textures, and of course foraging is now trendy.

I was asked to supply herbs for various events, and chefs wanted me to supply foraged ingredients on a more regular basis. They wanted to have foraged ingredients as part of their menus, on an ongoing basis. That's when I realised we needed more suppliers. *Wildfood Store* was born.

What is *Wildfood Store* and how does it work?

The concept is simple. Chefs in the city want clean, well-presented and fresh wild edibles. The farmers have edible weeds coming out of their ears! So I train farmers on how to harvest and package their

produce, and via a distribution company in the city, I deliver their weeds to the top restaurants in Sydney. The farmers get paid for their efforts and I bring their stories to the city's tables.

And how is this art?

Well, it all depends who is asking really! Put simply, *Wildfood Store* is a commercially

main issues that still need to be resolved are transport and shelf life. The plants that we can supply have to be transported in refrigerated trucks, and that is expensive. The volume that we can shift does not allow for bulk deliveries, so it is hard to find the balance between exclusive access and economies of scale. On top of that we just went through the worst drought in living memory, followed by a horrific fire season. Not much has been available in the past year. Now it is much better as we finally received some good rain in our region, but then COVID-19 came along and the whole hospitality industry collapsed overnight. Challenging times for everyone. So right now the whole project is on hold.

Still, we learned a lot and established some good connections. Here I share two stories that present different perspectives. One is from local foragers and follows the journey of their produce collection, and the other is from a bar manager, and shares the story they present to their customers via the produce. We are ready to go, with plenty more to offer.

viable forager's network. Another way of looking at this is that I am implementing a cultural intervention that aims to provide economic benefits for the participants. As an artist, rather than creating static visual statements, I am interested in creating systems that benefit society and change the way we operate and experience the world. This model allows me to collect profiles of people living on the land, people who are transforming their relationship with the environment. My model engenders up-cycling solutions for by-products of farming (weeds), and enables me to highlight indigenous and "exotic" (non-native) but traditional relationships to plant species. The stories I generate serve as marketing material for the promotion of the produce and become integral to the visual content for exhibition and dining events.

This is art that speaks of lived experiences; this is art that you can eat, and, if you have land, even make money from. In this way *Wildfood Store* fosters cultural transformation—now that's art!

Amazing. So two years on, how did it go? Have you and the farmers become rich yet?

Ha! You would expect so, with all the weeds out there, but no. It turned out that it was a bit more difficult than anticipated. The



TOP: Diego in The Living Classroom greenhouse, harvesting weeds for the feast that accompanied *The Play* at The Roxy Theatre in Bingara, 2018. BOTTOM: Diego at The Living Classroom sharing knowledge with Adam Marshall (Member for Northern Tablelands in the NSW Parliament, Minister for Agriculture and Minister for Western New South Wales). Photo: Rick Hutton.



LEFT: River Mint. Photo: Diego Bonetto. RIGHT: Kerrie Cooke and Tony Caporale with harvested pink peppercorns. Photo: Linda Foy.

River mint from Oberon

Evan Strove is the bar manager at Bulletin Place, Sydney. He's been buying river mint (*Mentha Australis*) from *Wildfood Store* for his cocktails. This has just become a regular fresh fixture at Bulletin Place. Colloquially known as river mint or native mint, this plant was traditionally used as a bush food, insect repellent and for its medicinal properties, by Aboriginal communities across the country.

Local foragers Sam, Tim, Ian and Alex harvested the river mint alongside a spring-fed creek near Oberon, NSW. This plant is one example of the produce sourced regionally by *Wildfood Store*.

My model engenders up-cycling solutions for the by-products of farming

Pink peppercorns from Capertee Valley

Peppercorn trees (*Schinus molle*) are quite common around properties in regional NSW as they were planted for their shade and handsome features. The berries are traditionally used as a pepper substitute. Tony Caporale, Mervin Vessey and Kerrie Cooke harvested some berries from some old trees in the Capertee Valley. Their harvest resulted in one kilogram of pink peppercorns that sold for \$250 to Archie Rose Distillery in the city.

Kerrie Cooke is a conservation landowner and president of Capertee Valley Landcare. Here's what she had to say about the experience of working with *Wildfood Store*:

"This opportunity was far too good for me to resist, so I picked a kilo of peppercorns for Diego with my son and neighbours. Primarily as a little experiment,

but mainly because I am curious as to the possibilities. The money we made was just a bonus.

It seems a shame that there is all this nutrition and generational knowledge being wasted. A few years ago my South American mate came to visit; being a bit of a foodie he noticed the mature peppercorn trees and harvested a handful to pop in with our evening roast.

My mother-in-law is Italian, she has taught me both the nutritional and the culinary benefits of including stinging nettles in my diet, and the value of many more weeds that she and her family used to survive off during the war: mallow, dandelion, stinging nettle, prickly pear ... Each time my-mother-in law visits I identify and learn of a new value for my weeds.

A Fijian lady who lived in the Capertee Valley briefly thought she was blessed when she discovered amaranth growing so abundantly there. She explained to me that amaranth is a highly prized herb, known and valued in Fiji for its blood cleansing qualities.

Is it our prejudices and preconceived ideas that steer us away from consuming the food and medicine literally growing under our feet?

Throughout Australia, weeds are spreading faster than they can be controlled

and management of them is consuming an enormous amount of resources. Climate change poses additional challenges to our ability to manage weeds.

Could this be part of our weed management scheme? Eat them!

Under our feet while picking peppercorns there was purslane, stinging nettle and mallow. Stinging nettles are high in iron! Stir-fry them with some onions, add some peppercorns. Whip up a salad with homemade goats cheese and purslane. Voila... dinner."



Diego Bonetto is a creative producer based in Sydney most famous for his urban foraging workshops. Building on knowledge acquired growing up on a farm in Italy, he introduces people to the food and medicine plants that surround us, and in the process creates convivial conversations around belonging, sustainability and agency.

Baking earth: soil and the carbon economy

LUCAS IHLEIN



Allan Yeomans and Lucas Ihlein extract a soil sample at Niels Olsen's farm in Hallora, Victoria, March 2019. Photo: Kylie Wilkinson.

In September 2018, I travelled from Wollongong to the Gold Coast to visit Allan Yeomans, the inventor of the *Yeomans Carbon Still*.

It seems fitting that Allan's workshop is located here, where hundreds of skyscrapers cluster along the beach, perched barely above sea level. What will happen to this place in the near future, when sea levels rise up and flood the streets, and storm surges erode the foundations of the buildings?

Across the world, low-lying cities like the Gold Coast are ever more vulnerable to the effects of climate change, and Allan Yeomans hopes that his invention can help tackle this global problem.

As the son of the late, great P.A. Yeomans, inventor of the Keyline Design system for ecological agriculture in Australia, Allan has an impeccable farming pedigree. Having worked with his father on the development of Keyline in the 1950s, Allan went on to create the Yeomans Plow Company, which to this day supplies the world with Keyline Ripper Plows—a farming implement designed to gently open the ground to air and water without churning it up or damaging the structure of the sub-soil ecosystem. Using a Keyline Plow helps farmers to build topsoil, increase fertility in their paddocks, and reduce their need for chemical inputs.

And now, over the last decade, Allan has been creating and refining a new tool for farmers. Where burning coal and fossil fuels releases greenhouse gases and accelerates global warming, farmers who adopt regenerative principles work with plants to draw carbon dioxide back into the soil. If, as many believe, emitters of carbon should be taxed for the atmospheric pollution they generate, then surely these farmers should be able to be paid for removing those pollutants from the atmosphere!

Allan realised that a simple, affordable and reliable way of measuring the carbon captured by farmers was missing—so he set out to create one

But how can farmers be paid? To do so, there must be a way of quantifying this process. Eight years ago, Allan realized that a simple, affordable and reliable way of measuring the levels of carbon captured by farmers was missing—and so he set out to create one: the *Yeomans Carbon Still*.

The device effectively “bakes dirt”—heating it to between 500–550 degrees celsius. This is the temperature at which any organic matter in the soil burns away.

By weighing the soil before and after this process, Allan can determine how much carbon has been lost—and therefore how much carbon the sample contained before processing. If a baseline measure is taken this year, and the process is repeated in subsequent years, then it's possible to work out the amount of new carbon the farmer has pulled from the air into the soil. Once you've done that, you can calculate how many dollars-per-tonne of carbon the farmer should be paid for providing beneficial services to the global ecosystem.

Right now, with Australian politicians bickering over electricity prices and energy supply schemes, an easily accessible system like this for compensating farmers who reduce the amount of carbon dioxide in the atmosphere still seems like a long time away. But the world is waking up to the urgency of the problem and the need for solutions.

Once a simple legal and political framework has been worked out, Allan

envisages a financial incentive scheme for carbon reduction that will transform the way farming is done on a colossal scale. If all the farmland in the world increased its soil carbon content by just one–two percent, he argues, this would be enough to draw down all the excess carbon dioxide that has been released since the industrial revolution. The depletion of the world's agricultural soils from chemical farming throughout the 20th century means there is enormous scope for this remediation work—not only as a means of carbon sequestration, but also delivering broader ecosystem benefits through soil health.

The difference between the *Yeomans Carbon Still* and existing systems for measuring soil carbon lies in its simplicity and affordability. Compared with expensive lab equipment, a *Yeomans Carbon Still* will set you back only AUD\$10,000. Rather than paying thousands for each soil test at a commercial lab, a group of farmers could collectively purchase the means to do the testing themselves. The Still works with soil samples up to two kg in weight—much larger than the tiny amounts used in standard soil carbon testing devices. This reduces the possibility of skewed results when small samples are taken as a representation of a vast paddock.

Towards the end of my visit to the Gold Coast, I took Allan to meet two key people:

sugarcane farmer Robert Quirk (former winner of Australian Carbon Farmer of the Year Award) and Indigenous land manager Russell Logan. My hunch was that alliances like this—between inventors, farmers, and Traditional Owners who steward vast areas of the Australian interior—could be a key to making large scale soil carbon drawdown possible. In conversation with Allan, both Robert and Russell agreed that the Carbon Still could be a valuable tool for helping to quantify carbon in agricultural and bushland soils. The key tipping point will happen when Allan's invention gets legally ratified by the government as an instrument for generating soil carbon data.

At 88 years old, Allan continues to refine his system, and to lobby government and soil scientists to adopt his *Yeomans Carbon Still* protocol as a valid methodology for soil carbon testing. There are still many problems to be worked out, including how to legislate to fairly reward farmers for their efforts, but the time is ripe to seriously begin this discussion.

* * *

Following my trip to the Gold Coast, Allan and I began collaborating, hatching a plan to bring the *Yeomans Carbon Still* to

wider public attention. In 2019, following countless hours of logistical planning and risk assessments, we succeeded in exhibiting a fully functioning *Yeomans Carbon Still* at Melbourne's Monash University Museum of Art (MUMA), in an exhibition curated by Hannah Mathews called *Shapes of Knowledge*. In the pristine gallery, the device gleamed like a Rolls Royce on the showroom floor. At regular intervals, Allan and his trusty assistant Darren Williams demonstrated its use, baking soil samples and showing visitors how the system works. One of Allan's smartest ideas was to use his time as "artist in residence" at MUMA to teach his 21 year old grand-daughter Rhiannon Sutton-Yeomans (a Melbourne design student), how to use the Still. This intergenerational knowledge transfer clearly demonstrated how accessible the Yeomans system can be for non-experts.

Allan and I hosted workshops with many student groups from Monash University, guiding discussion around the question of soil's relationship to land management, farming cultures, and climate change. These conversations culminated in a public forum on the challenges surrounding soil

carbon sequestration payment systems, featuring Louisa Kiely from Carbon Farmers of Australia, environmental law expert Dru Marsh, farmer Niels Olsen, and of course Allan himself.

One of the richest engagements of our Melbourne exhibition was a bus trip to regional Victoria. Artists, environmentalists, politicians, permaculture practitioners, and farmers booked in to experience first hand the agricultural methods of Niels Olsen and his family. In 2019, with the help of soil sampling expert Adrianna Marchand, and Matthew Warnken of Agriprove, Niels became the first Australian farmer to receive carbon credits under the Emissions Reductions Fund. Niels' farm stands as an inspirational proof of concept, showing not only that multi-species cropping improves soil health, but also how farmers can navigate the complex legal framework of government accreditation to receive payments for carbon sequestration.

A growing coalition of farmers, lobbyists, environmentalists and scientists across Australia is working to make the drawdown of atmospheric carbon dioxide using agricultural soils into a viable climate change solution. The rewards for

this initiative are manifold: healthier soil, more drought-resistant farmland, increased biodiversity, an extra income-stream for farmers, better quality food, reduced pesticide and fertiliser use, happier farmers, and an increase in community awareness about food and land-management systems. Innovators like Allan Yeomans, Niels Olsen, Mathew Warnken, Louisa Kiely, Robert Quirk, Adrianna Marchand and Russell Logan are the true avant-garde, catalysing cultural change for global environmental benefit.



Dr Lucas Ihlein is an artist who explores the relationship between socially engaged art, agriculture and environmental stewardship. His most recent project was *Plastic-free Biennale* with Kim Williams, part of *NIRIN*, the 2020 *Biennale of Sydney*.



Allan Yeomans and grand-daughter Rhiannon Sutton-Yeomans with the *Yeomans Carbon Still* in the exhibition *Shapes of Knowledge* at Monash University Museum of Art, 2019. Photo: Christian Capurro.

What is humus?

LAURA FISHER

This article was originally published on the KSCA blog in April 2018.

This is the first blog post for the project *humus:human*, which involves myself, artist Jono Bolitho, and farmer Glenn Morris.

How did this project come about? In 2017, members of KSCA visited Billabong, the organic grazing property Glenn manages in Inverell. We knew Glenn because he had attended *Futurelands2*, and also because he was a bit famous for riding his horse Hombre across the Sydney Harbour Bridge in protest against NSW land clearing laws. Our tour of Billabong was an amazing experience for all of us, and helped us understand what 'regenerative agriculture' looks like in practice.

Glenn talked passionately about humus, and about how it was key to the regenerative work he'd done. I became very curious about it, and sought Glenn's advice on what to read. He had done extensive research during his Masters in Sustainable Agriculture, and told me the best writing on humus came from soil science that predates the mass take-up of industrial farming methods that rely upon synthetic fertilisers and pesticides (which is most agriculture today).

So I read bits and pieces of writing by people like Selman Waksman, the pioneering microbiologist and biochemist. In his 1936 book *Humus: Origin, Chemical Composition and Importance in Nature*, he writes that humus 'probably represents the

most important source of human wealth on the planet. Nature has stored... a vast amount of readily available energy, a large part of the carbon needed for life processes, and most of the combined nitrogen, so much needed for plant growth'.

Humus represents the most important source of human wealth on the planet

The crux of it seems to be that in healthy soils, humus is both produced by, and a kind of infrastructure for, a whole universe of microorganisms that are circulating minerals and nutrients among themselves, as well as oxygen and water molecules, as well as various biochemical reactions and so on. The starting point for understanding humus is photosynthesis, the process by which plants convert carbon in the atmosphere—the sun's energy—into food. They use this food to build their bodies both above and below ground, but they also pump a lot of it into the soil via their roots, where it is traded with microorganisms for other nutrients that the plant needs. So the carbon becomes a kind of chemical energy that fuels the fertility of soil.

Which is not to say that I now feel I understand humus. The Wikipedia entry is oddly reassuring on this front:

It is difficult to define humus precisely because it is a very complex substance which is not fully understood. Humus

is different from decomposing soil organic matter. The latter looks rough and has visible remains of the original plant or animal matter. Fully humified humus, on the contrary, has a uniformly dark, spongy, and jelly-like appearance,

and is amorphous; it may gradually decompose over several years or persist for millennia. It has no determinate shape, structure, or quality. However, when examined under a microscope, humus may reveal tiny plant, animal, or microbial remains that have been mechanically, but not chemically, degraded. This suggests an ambiguous boundary between humus and soil organic matter. While distinct, humus is an integral part of soil organic matter.

There's something very appealing about diving into a topic that an expert community agrees "is not fully understood". Time to bring in the artists I say! Glenn, unlike the rest of us, seems not to be confused about humus. Last year I asked him to define it for me, and I'm so glad I recorded our conversation. He held an imaginary handful of it, feeling its texture and said this:

So we've got the organic matter breaking down, the lignin material, we've got the organic compounds, the

sugars coming through the root system, we've got all sorts of other soil life breaking down, dying, reproducing, the microbes, the fungus, the sugars, so the whole lot is interacting, and then, they're bonding with the cations in the soil, so you get a bridging effect between the humus and the clay particles in the soil, so all of this is forming what we call stable humus. It's a very complex situation.

Yes. It sounds like a very complex situation indeed.



Dr Laura Fisher is an artist and social scientist. Her projects build fruitful connections between the city and the country to support land regeneration, better food systems and community wellbeing. Laura is a founding member of Kandos School of Cultural Adaptation (KSCA) and a social researcher with The Mulloon Institute.

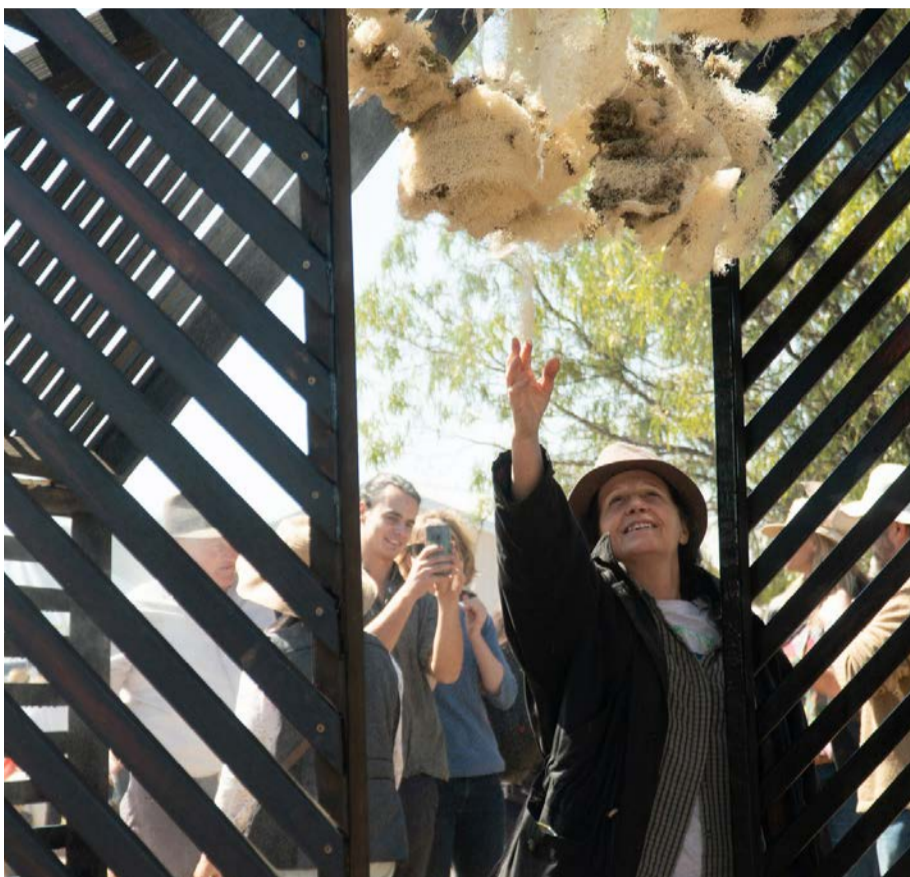


The *Humus House*, digital model created by Jonathon Bolitho.

Humus House

JONATHON BOLITHO

“If you were a tiny organism in a forest’s soil, you would be enmeshed in a carnival of activity, with mycelium constantly moving through subterranean landscapes like cellular waves, through dancing bacteria and swimming protozoa with nematodes racing like whales through a microcosmic sea of life.”—Paul Stamets



The *Humus House* installed at *Groundswell* (left) and *Cementa* (right). Left photo: Vickie Zhang. Right photo: Ian Hobbs.

What would it feel like, to be a microorganism living in healthy soil? What if we could shrink ourselves down and get a glimpse of what was really going on, right under our feet?

The world in the soil is as complex and varied as a metropolis, yet it is totally mysterious to most of us. It seems fitting then to look at humus, the organic material in topsoil upon which all life on earth depends, through an architectural lens.

Humus is a complex, interconnected structure that is able to hold water, nutrients, and life itself. Gel-like, yet solid. A spongy matrix of surfaces and voids.

At *Groundswell*, Charles Massy said that “healthy soil is a bit like a cathedral”. Not the most obvious metaphor, but it’s all about perspective. At the microscopic level, you can almost feel the grandeur of the towering, echoing spaces within soil. It also encapsulates the reason why people go to cathedrals: to gawk at the vast spaciousness, the voids cradled by beautiful surfaces. That’s healthy soil. And healthy soil always contains humus.

Okay, but why does soil at the microscopic level need all these complex spaces and structures? Well, to cycle water, nutrients, carbon and nitrogen—all essential to growing the plants that create the air we breathe and the food we eat.

As artists working with soil, it’s our job to translate these processes into something

we can understand and experience, whilst also creating something of a scientific model. Too metaphorical and it loses credibility, too sciency and it becomes dry.

With our project *humus:human* we wanted to see if it was possible to combine the two. Once we honed in on our architectural approach in the second year of the project, we set out to create an installation that would illustrate the function of humus, centered around the idea of its water-holding capacity. Humus is inherently good at water conservation and retention, holding up to four times its weight in moisture. We learnt much about this from farmers whose innovative methods have enhanced the water-holding capacity of their soils. This was a crucially important angle for us to take, given the nature of the drought and climate crisis much of rural Australia is facing.

Enter the *Humus House*. When thinking about how these ideas would actually materialise, we became fascinated with this idea of soil architecture, scaling up micro structures to the macro level for we humans to experience. But who are the architects in this microscopic scenario?

It’s the mycelium, the nutrients, the microorganisms, the solids, liquids and gases that constantly churn, filter, regulate, extract, metabolise, catabolise, photosynthesise, vaporise, trade, dissolve, digest, immunise, solubilise, clean,

synthese, store, fertilise, and inoculate.

There’s a lot going on! During our collaboration, we talked a lot about how to demystify these processes. Hoping to shine a light on the intricate biological processes of humus, we got thinking about what form this structure would take.

Looking to the past and exploring the heritage of the Australian Bush House from the late 19th and early 20th centuries, we wanted to create an airy, damp space teeming with life. A slatted structure seemed like an appropriate starting point. Pre-dating greenhouses (glass didn’t make it over on the first ships from England because it was too fragile), structures like these were often filled with ferns and tropical plants, allowing slanted sunlight to pass through and providing much needed shade in a dry and arid Australian climate.

During our months of prototyping we’d become intoxicated by the idea of the humus floccules Glenn painted in our minds. Yes, floccules are a real thing: tiny gluey spheres that cling together to create the solid-in-a-liquid structure of soil. So we wanted to pay tribute to the magic of this idea as well.

The idea of a house-like structure really stuck with us: a home fit for a microbe. Imagine a space that you can physically walk through and explore. Imagine water misters, covering everything in a cool, glistening mist. Imagine the

structure illuminated at night, bathed in multicoloured hues to visualise the gaseous vapours and nutrient exchanges that are happening a thousand times a second. Imagine the slatted timber formations that cast long, interlacing shadows across the floor.

Because if you can’t imagine what is happening to soil at a microscopic level, then how can you appreciate it?

This is where the collaboration between Laura, Glenn and myself in the *Artist Farmer Scientist* project brought us. Keep your eyes peeled, you might see a *Humus House* crop up in a school, garden, city, art gallery or farm near you. And if you do, please step inside for a moment to experience, if only for a moment, what healthy soil really feels like.



Jonathon Bolitho is an interactive media artist working with light, sound and emerging technologies to create tactile and engaging experiences. He has exhibited large scale interactive works in Australia and internationally. With a background in permaculture, his work often takes inspiration from the natural world.

Humus: essential for life

GLENN MORRIS

Humus is one of the least understood living forms on earth. There is probably no other living matrix on the planet that offers as much hope for reversing global warming, restoring abundant water cycling and delivering maximum health benefits to all life. We can achieve extraordinary things if we restore a soil humus foundation in our landscapes.

My research over the past twenty years has given me some appreciation of the immense value of humus in restoring healthy landscapes and ecosystem processes.

This article offers a small insight into the complex subject of humus and its importance as we navigate away from a degraded environment towards a regenerated earth. It is informed by the research of world-leading chemists, biologists and soil scientists like Selman Waksman, Alexander von Humboldt, Kevin Handreck and Raina Maier.

What is humus?

Humus is an amorphous substance, meaning it has no defined form.¹ In other words, every formation of humus is unique to its specific site.

Humus occurs not in a definite solid or liquid state but is often described as having a plasma or gel-like consistency.² Organic and inorganic colloidal particles are fixed in a gel-like matrix, a formation sometimes referred to as 'flocules of humus'. A colloid is a mixture in which tiny particles of one substance are scattered throughout another, where these substances don't chemically combine (milk, cream and blood are also colloids).

Humus is also a macromolecule. The components of organic residues that have been broken down in the soil cluster form a residual chain framework, like a mesh fence, for the gel-like materials to bond to. Carboxyl-group compounds like quinones and phenolic acids attach to each other, and also to amino acids and other compounds. This process leads to the formation of the humus macromolecule.³

Humus is also sometimes referred to as a 'living milieu' in which the breakdown products from organic matter combine with each other. These could include lignin, as well as living root exudates, and glomalin, which derives from mycorrhizal fungi and bacterial glues.⁴

Raina M. Maier describes humus formation as a two stage process. In the first stage there is:

formation of reactive monomers
[quinones and phenolic acids]

during the degradation of organic matter, followed by the spontaneous polymerization of some of these monomers into the humus molecule.⁵

Humus has high electronegative properties, allowing strong bonding with ions and clay to form 'stable humus' or the clay/humus complex. The electro-bridging effect of ions (both negative and positive) and the adsorption properties of colloidal clay particles then give even greater permanence to the humus body within the soil matrix.

Reversing global warming, restoring abundant water cycling and delivering maximum health to all life—we can achieve extraordinary things if we restore soil humus in our landscapes

As well as storing vast amounts of carbon, humus contains large amounts of nitrogen, largely in the form of true protein and amino acids.⁶

This is only a very brief description of how amazing and complexly structured humus is.

How is humus essential for life?

Just one hundred grams of humus has a surface area of over eighty thousand square meters, providing the primary structure for soil life.⁷ This means humus is the foundation for the web of life on earth. Some have estimated that one hundred grams of humus can provide a home for over two hundred and fifty billion microbes.

Landscapes with good levels of humus are enormous reservoirs of fresh water. This is due to the large surface area, the super sponge-like qualities of humus and the effect this has on the entire structure of the soil matrix. This reservoir, when fully hydrated, is responsible for ensuring regular functioning of local water cycles as well as being the source of perennial river flows across the earth. Just one hectare of soil at thirty centimetres of depth with ten percent humus can hold over 1.6 million litres of water.⁸

Humus is a source of health for animals and humans. Humus contains over half a million different organic compounds and it has five times the nutrient storage of clay.⁹ Such is the importance of the high nutrient storage of humus and its impact on the soil matrix that just three percent humus in the soil can be responsible for half of the soil's

nutrient storage. These nutrients and health compounds include essential amino acids, minerals, vitamins and vital secondary metabolites and phytonutrients.

How can we regenerate life with humus?

One of the real dilemmas facing the world is that there is too much carbon in the atmosphere and too little carbon in our soils. There is already enough carbon dioxide in the atmosphere to keep heating the earth for centuries. At the same time,

the world and all life that comes within his or her reach.¹³

Now more than ever, with so many challenges facing the earth's ecosystems there is a need to adopt a greater 'reverence for life' and show respect for the remarkable complexity of natural processes such as humus formation.

1. 'A simplified representation of the chemical nature and reactions of soil humus'. *Journal of Agronomic Education*, 18(2), pp. 84-88.

2. Ibid.

3. Ibid.

4. Hennig, E. (2016). *Secrets of Fertile Soils: Humus as the Guardian of the Fundamentals of Natural Life*. Acres U.S.A.: Austin, Texas.

5. Maier, R.M. (2009). 'Biogeochemical Cycling'. In: Maier, R.M., Pepper, I.L. and Gerba, C.P. (Eds.). *Environmental Microbiology*. Academic Press, p. 295.

6. Waksman, S.A. (1936). *Humus: Origin, Chemical Composition and Importance in Nature*, Bailliere, Tindall and Cox: London.

7. Handreck, K.A. (1979). *Organic Matter and Soils*. (Discovering Soils, No. 7). CSIRO: Adelaide.

8. Morris, G.D. (2004). *Sustaining national water supplies by understanding the dynamic capacity that humus has to increase soil water-holding capacity*. Unpublished master's dissertation. University of Sydney, Australia.

9. Albrecht, W.A. (1975). *The Albrecht Papers Volume II: Soil Fertility and Animal Health*, Acres U.S.A.: Kansas City, Missouri.

10. Morris, *Sustaining national water supplies*.

11. Waksman, *Humus*.

12. Schweitzer, A. (1933) *Out of My Life and Thought, An Autobiography*. Translated by C.T. Campion. George Allen and Unwin Ltd.: London, p. 188.

13. Schweitzer, *Life and Thought*, p. 188.



Glenn Morris is a holistic cattle farmer based in Inverell, Northern NSW. He has researched and practiced advanced land stewardship for 20 years, and has featured in several documentaries about regenerative agriculture. His Masters studies helped advance the concept of carbon sequestration in Australia. Glenn is an active member of Farmers for Climate Action.



TOP: Members of KSCA with Glenn Morris at Billabong Farm in 2017. Photo: Laura Fisher. BOTTOM: Jono Bolitho and Glenn Morris collecting humus at Billabong Farm, 2019. Photo: Laura Fisher

Makeshift memento

GEORGIE POLLARD

In this personal and philosophical essay, Georgie Pollard reflects on her partner Alex Wisser's Earth Oracle performance at the Groundswell festival. See Alex's poem on page 32.

This morning as I write, mud falls from the sky. At first I think it's rain. I go outside to check on how much has fallen. Red topsoil is covering everything, the water has evaporated quickly and left behind circular splotchy evidence that water has fallen. We've been in drought for three years now. The Murray Darling has dried up, towns are without water and millions of fish have died. Last summer there was hardly a clear day with almost constant dust storms and this summer the scale of the bushfires and the loss of animal life is overwhelming. The violence of climate change is here and it's terrifying. It's impossible to know what to do.

The opening night of *Groundswell* and *Pulse of the Earth* was a beautiful Welcome to Country, Indigenous dancing and music. But before the opening, scores of people were busy preparing in the heat; food vans were cooking, tents were going up, tech support was connecting projection screens and microphones. At around five in the evening there was a pause as we all stopped to watch a massive red cloud roll in. Without time to batten down the hatches, we were blasted by 30km hot winds blowing dust into our eyes. The sun turned red and it felt like we had beckoned the end of days. All the while, Alex was quietly sitting in a hole, sheltered from the wind, the heat and the drama.

Alex had spent a month in residency at The Living Classroom digging a hole that was three metres deep and one and a half metres square. He's dug a hole before as an artwork and it was done with a spirit of irreverence. There is something beautifully contradictory in the idea of doing that much hard labour as a joke. I love Alex. Neither of us are 100% sure when we met, it was either 2001 or 2002. We met in a pub and I liked his purple tartan pants and

the way he bit his lip with concentration when he danced. He made me laugh and he didn't care what anyone else was thinking. As it turns out, it is one of the qualities that I love about him the most, his irreverence. Irreverence, I think, is about space: space to relax, space to think and space to laugh. The space of irreverence is also a very forgiving space, and I really needed that.

With his work for *Groundswell*, Alex would spend two days in the hole fasting. His intention was to commune with the earth and we could send questions down to him that the earth might answer, with Alex as the oracle. It was a strange proposal, not something I associated with the irreverence I had come to expect from Alex. When he first told me about what he was doing, I sort of just shrugged my shoulders and was a bit puzzled. The concept didn't grab me. One of the many aspects of conceptual art that I love is that an idea can communicate across distance. If I tell you about an artwork like a pile of candy in a gallery by Félix González-Torres, you don't have to have been there to "get it". The work is untitled but the concept is that 175 pounds of candy in the corner of a gallery represents his lover Ross' ideal body weight. The audience is invited to eat the candy and this process reflects the virus eating away at Ross' body as he dies of AIDS. Even though the experience of actually eating that candy adds another level of meaning, the idea behind the artwork can spread in a beautiful and tragic abstract form, reaching many more people, like a virus.

Alex's work didn't really do that. But as I observed the way people responded to his "spiritual" presence, I began to change my mind. Amongst the crowd, there was this beautiful sense of faith in him. I didn't share this sense of wonder: What would Alex say after spending time fasting and



Alex on residency at The Living Classroom, 2019. Photo: Justin Hewitson.





Glenn Morris & Alex Wisser, Before/After, 2017.

This photo captures an area of Billabong farm near Inverell in Gamilaraay Country, New England, NSW. As you can see, the farm has been transformed through Glenn Morris' careful regenerative stewardship. The "picture within the picture" was taken a decade earlier, in 2007.



Alex Wisser performs *Earth Oracle* from inside the hole at 8am at *Pulse of the Earth*, 2019. Photo: Vickie Zhang.

communing with the earth? I really only thought of his irreverence. This is Alex we are talking about.

I stood back and watched. As people rushed to get ready for the opening night of the festival, complete strangers and friends alike went over to Alex to see how he was. I was in the kitchen looking after our toddler Rufus, getting ready to take him some water, when I heard someone ask, has anyone checked on Alex? It was hot, so hot. I was handed water; here, this is for Alex. The guy who handed me that water was too busy trying to save his food tent to take the water himself. I learned later that his tent had ripped apart and dust had spoiled all of his produce. Apparently the lemonade that he and his family make is legendary but we didn't get to try it because it had been ruined by the dust. There was so much work to be done to get ready, to save tents and food. Amidst all of that, people cared for this crazy hermit in a hole on the edge of the action.

As I observed the care that people gave to Alex, I was reminded of the figure of the Garden Hermit. From what I could remember, this figure, a person, would live in a rich person's garden, provided with a modest bed and food. The garden hermit was abstracted from the history of monks and hermits that renounced worldly possessions to live a spiritual life. Incorporated into landscape design during the 18th and 19th century, the hermit was not allowed to bathe, brush his hair or cut his fingernails. Did the hermit at the bottom of the garden have the effect of bringing out or at least attempting to call forth the best qualities of humanity? They were a living breathing garden sculpture, but they were intended as a memento mori, which in latin means: remember that you too will die.

But the garden hermit was more

like an ornament than an actual hermit that lived a spiritual life. The difference between deciding to renounce material possessions and actually becoming a material possession is a big shift in meaning. Historically, this shift in meaning corresponds to the formative stages of capitalism. The garden hermit doesn't ring true as a memento mori. We know it's meaningless. By paying someone to perform the spiritual role of the hermit the wealthy landholder has outsourced their better self, their conscience. It's a self-flattering reflection. An empty vanity. This emptiness reminds me of a person dressed in a sandwich costume on the side of the road. Polyester padding in the stinking heat of summer, paid to beckon you in, "satisfy your hunger here". We drive by, detached. It's hard to comprehend the particular meaninglessness of that suffering. What sort of culture does that, pays a person to be a sign? It's the same culture that produces a constant stream of meaninglessness; pointless administration and bureaucracy, redundant gadgets, senseless destruction of the natural world. It's the same meaninglessness found when fire takes your neighbour's house but not yours. Culture is supposed to mediate meaninglessness, not produce it.

Crisis has a way of bringing out meaning. If you are one of the thousands of people who've had to evacuate during the recent bushfires, you will have decided what you will take and what you will leave behind; you realise what's important to you.

For most people it's family, the animals, the memories of loved ones. That's it. Material possessions fall away. That's what a memento mori is supposed to do, remind us of the important things. When we remember what's important, we make better choices. As I was watching people who were doing the best that they could to save their livelihood in this extreme wind, they didn't just look after themselves—they took the time and energy to make sure that this stranger in a hole was ok. It seems we are not so detached from each other after all. The context has changed. In the face of a natural disaster, the scaffolding of capitalism falls away and it's not as natural as it likes to appear.

Groundswell is being held in a paddock. Alex is sitting in a hole. His proximity to the action is what makes this work special. I ask him how he is. He's good. He can barely hear the wind, certainly can't feel it, it's cool and peaceful in the earth. Does he feel connected to the earth? He tells me later that no, of course he doesn't. He thought about being funny, he thought about what sort of effect that he wanted, he thought about putting on a character. In the end, he was so exhausted and hungry that he couldn't do any of these things. Alex no longer has the energy for a detached

So, the morning after the opening of the festival, as the first item of the day, Alex will emerge from his hole. But first he will answer the questions that we all have, the questions that we've asked the earth, he will answer from inside the hole. He reads and I start to cry. He's pretending to be the earth and yet it is true. Truths and untruths are bound together, we hold them both delicately in our hands, protective. What I didn't know was how much I needed the earth to tell me it will be ok. But somehow Alex did. And he had found a way of saying it that I could hear. We already know truth is dependent on context, but what I'm beginning to wonder is; in order to hear a truth like this, perhaps it is also dependent on artifice. This artwork will not go down in the history books as a great work of art. Had the wind not torn tents and spoiled food, would his art work have meant what it did? A great art work "transcends" time and space, but is that what we need? Or is it better to be able to respond to what is happening, at the time and place in which it is happening? All I know is that being here, listening to Alex read his poem, this is where I want to be right now. I wish you were here.

Truths and untruths are bound together, we hold them both delicately in our hands



Georgie Pollard is an artist living and working in Kandos NSW. She is interested in how art functions and uses diverse media to explore how art might intervene and generate ideas, reflection and new relationships within communities.

Earth Oracle

ALEX WISSER

For *Artist Farmer Scientist*, Alex Wisser worked with Rick Hutton at The Living Classroom to create a permanent public artwork: a three metre deep hole, hand-dug by Alex on site.

A work of intense manual labour executed over several months, the hole acts as a prompt for exploring the myriad relationships between above and below. At the *Groundswell* and *Pulse of the Earth*, Alex decided he would spend two days fasting and living in the hole. Taking on the persona of the *Earth Oracle*, he invited festival visitors to write and pass down their questions. If the Earth could speak, what would it say? Alex delivered his poetic response live from the depths of his hole at the conclusion of the durational performance.



Thank you for coming.

Thank you for bringing me your questions.
To begin, I would like to ask a question
of my own.

Who here understands the earth? If you would
ask a question of the earth, who amongst you
can understand its answer?

Let me ask you the same question in a different
way. Who stands under the earth? Ah... the
answer comes too quickly. Is it even a question
if the answer arrives as soon as it is asked?

A question occupies time, drawing you towards
the horizon, and is only as good as the length
of time it takes to answer is long. Why then
would you throw your question into a hole in
the ground as though you would be done with
it? Be patient with me, I will give you your
answer in time.

I understand why you have come to me.
I stand under you. Everything you do has me
underneath it. I give you your life and I take
your dead. I am the relative of stars. Believe
me when I say that I understand you.

You have come to me like lost children.
Anxiously you want to know what will become
of you. You already know—the same thing as
always happens. You are scared and confused.
You have unleashed forces you cannot control,
forces that rage in your own breast.

I earnestly want to give you an answer,
but I can only give it to you in time.

You are the strangest children I have ever
produced. What an adventure you have had.
What brilliant, clever, terrible creatures you
are. Your excessive pride is almost justified.
Look at how much you have learned with your
science, how you have multiplied, how you
have taken every form and mastered every
material. You have the destructive prodigality
of the nature that you are. I am proud of you.

Your intelligence unfolded with such force,
like a crystal forming violently until it looked
like you would pierce the sky. Perhaps you
will yet. Who knows. The thought makes me
tired. You were born to seek horizons and so
it comes as no surprise that you would launch
yourselves even at mine.

And so when you return to me and give me
your question, you see—when you want to
know its answer, when you want to know—
you want me to take your question from you,
to relieve you of its demand, of its drive toward
the horizon—that is still the same motion.

If I could, I would give you the consciousness
of a star. After all I am a mother, I love my
children unreasonably. I would give you the
perspective that sees all of time. If you could
witness mountains rise out of the crust of my
body and wear back into it, perhaps you would
feel less anxious. Perhaps the storms that
churn your oceans would quell and the winds
that drive you toward the stars would slacken.
Is this not a beautiful dream? Knowledge is
useful, but we know it is not useful for that.

Is this not the error that all your knowledge
is founded on? That it will give you peace?
That it will make you feel safe? Imagine
wanting to know your future. What a thing
to desire. Is that not why you live your life?
For me there is no difference between wanting
to know the future and wanting to live.
You see what circles your questions tie me
into. Ultimately, I am talking to myself.

Take your questions. I return them to
you as the only gift I can give you now.
You have a horizon that calls you to it.
I will answer your question there.



Alex Wisser is an
artist and creative
producer, a co-
founder of *Cementa*
contemporary arts
festival in Kandos
NSW and a founding
member of KSCA.
His community

engaged, cross-
disciplinary projects
explore the potential
of art to participate
in everyday cultural
contexts, especially
the regional context
in which he lives and
works.

Carbon science: carbon culture

KSCA AND THE LIVING CLASSROOM



In June 2018, Jonathon Bolitho, Laura Fisher, Georgie Pollard and Alex Wisser spent a week in residence at The Living Classroom, along with collaborators Glenn Morris, Ruy Anaya de la Rosa and Adam Blakester. Carbon was central to all our projects, and so we bravely decided to invite the public to share the journey.

Together with Rick Hutton and Garry McDouall we welcomed 80 school students and teachers from Bingara Central School, and hosted a lively adult workshop at The Living Classroom. Participants dug a biochar pit and cooked up a batch of biochar. The students role-played elements of the photosynthesis cycle in some radical costumes, hunting for carbon, oxygen and water molecules. They also made

sound art using soil-moisture sensors, and collected soil samples to compare their humus content and water-holding capacity. And everyone got active making huge collaborative charcoal drawings, created with “freshly baked” willow charcoal, in a unique adaptation of musical chairs.

While carbon is often painted as the villain, the workshops showed how tightly this crucial element is woven throughout our lives and ecosystems.

CARBON SCIENCE : CARBON CULTURE



Carbon is one of the most abundant elements in the Universe, and in our bodies. It gives us fire, diamonds, graphite and coal. Friend and foe, creator and destroyer, it is a source of fertility in our landscapes and chaos in our climate.

Learn about biochar, a charcoal-based soil additive that re-purposes farm waste and builds soil fertility. We will hear from those involved in the Biochar for Sustainable Soils (B4SS) project, active in six countries.

Build a Kon-Tiki biochar kiln and produce a batch to take home with you. We will also test a charcoal drum oven.

Learn about The Carbon Farm, a world-first demonstration site for showcasing carbon sequestration methods in farming and land management.

Join discussions and activities led by artists in residence at TLC involved in the ‘An artist, a farmer and a scientist walk into a bar...’ project. We will explore how carbon features in their projects, and speculate on how carbon can be re-imagined in modern society.

Facilitated by:

Ruy Anaya de la Rosa - environmental scientist/ B4SS Project Director
Adam Blakester - sustainability entrepreneur / founding Director of Starfish Initiatives
Georgie Pollard, Alex Wisser, Jono Bolitho, Laura Fisher - artists
Rick Hutton - educator/CEO, The Living Classroom
Garry McDouall - farmer/Chair, The Carbon Farm

Join us for a fascinating workshop at The Living Classroom (TLC) to gain a fresh perspective on Carbon.

Where: The Living Classroom, 1 Killarney Gap Road, Bingara

When: Sunday June 24
10:30AM to 3:00PM.

Bring: A light lunch - we will provide damper, soup, tea and coffee.

Tickets: \$20. To buy, visit www.kzca.land/events/2018/6/24/carbon-science-carbon-culture
Children welcome, places limited!

Contact: Rick Hutton
0438 355 197 or rhutton@gwydir.nsw.gov.au



The Gwydir News

Incorporating The Bingara Advocate and The Warialda Standard

Bingara (02) 6724 1127

Warialda (02) 6729 1460

Vol. 2. No. 34

WEDNESDAY, SEPTEMBER 11, 2019

Price \$1.50 incl GST



Georgie Pollard's "carbon sequestration collaborative drawing" at *Pulse of the Earth*, 2019. Photo: Vickie Zhang.

Earth still pulsing from the weekend's festival

Reprinted and abridged from the Gwydir News, Vol 2 Number 34, Wednesday September 11th, 2019.

The Earth's pulse was in overdrive over the weekend for the inaugural *Pulse of the Earth* festival, hosted at The Living Classroom (TLC) in Bingara.

The blustery weather blew visitors in from as far away as Victoria to Queensland, coupled with a sprinkling of international visitors.

"Friday night was disappointing in numbers but the stoic people who did make it, found the volatile weather enhanced the experience and helped to bond all the different people that were there," explained committee member, Garry McDouall.

"It really brought it home to those from

the city, that things are tough out here."

"City folk were impressed with how resilient we are and how we can make the best of any situation," added committee member John Bishton.

John told the *Gwydir News* that there were approximately 1000 people over the weekend with 50–60 campsites at the Showground.

The *Groundswell* marquee was packed full of attentive attendees, listening to the various disciplinary guest speakers who are experts in their fields, developing dialogue and encouraging an interchange of ideas over the weekend.

"We had over twenty people talking and there was this incredible buzz in the marquee; the artists really embraced regenerative agriculture and with great passion," said Garry.

John spoke highly about the talented musicians that graced the stage over the weekend. "The musicians were fantastic and none of them had ever played in such weather conditions, but they really got into the evening and thought the dust storm was quite a novelty," said John.

Garry explained how climate change was actively approached over the weekend and that we have to face it, but also be patient as change takes time.

"Damon Gameau's documentary *2040* had over 200 people watch his film in the Roxy Theatre on Saturday evening, which is incredible, and he was engaging to listen to before and after the film," said Garry.

The event catered to everyone, providing plenty of entertainment on the main stage, various market stalls to wander through as well as interactive market stalls,

creating a wholesome family friendly event that the whole region could enjoy.

"This event was an experiment as originally the space at The Living Classroom wasn't designed for events, but this is what puts country towns like Bingara and the Gwydir Shire on the map," adds Garry.

Garry explains how if this narrative can continue to be developed, more visitors will come and explore the area.

"There was so much positive feedback from those who attended, appreciating the space and what is being achieved here at TLC. Whilst they're here, these visitors are boosting the local economy and hopefully when they go home, they're sharing the word of the region with their friends and family."

"The theme of regeneration and

Bingara and Districts 20
VISION 20
PRESENTS

PULSE OF THE EARTH

A FESTIVAL OF REGENERATION

FREE CAMPING AT BINGARA SHOWGROUND

BINGARA
6th-8th
September

FESTIVAL PROGRAM

FRIDAY 6TH

Where: The Living Classroom Entry: Gold coin donation
Bring: Cash for food and stalls, BYO Alcoholic drinks NO GLASS PLEASE Chairs & Rugs
4.00pm Gates Open

FANTASTIC FOOD, FESTIVITIES, FIRE TWIRLING, BELLY DANCING AND FUN FOR THE KIDS

5.30pm Warm up acts Indigenous Dancing & Didgeridoo, Bellydance Earth & Sky
6.30pm Sneak peak of Groundswell program Laura Fisher
6.45pm Questions for The Earth Oracle
7.00 - 9.00pm Concert THINGS OF STONE & WOOD

SATURDAY 7TH

Where: The Living Classroom Entry: Gold coin donation collected by Bingara Gym committee
Bring: Cash for food and stalls, BYO Alcoholic drinks NO GLASS PLEASE Chairs & Rugs
7.30am Yoga at the Aussie Farm Dam Karen Bishton - Selah Yoga
8.20am The Earth Oracle; performance at The Hole

THEN ON THE MAIN STAGE:

9.10am Belly Dance Earth & Sky
9.30am Welcome to Country & Smoking Ceremony
Official Opening: Former Senator John 'WACKA' Williams
10.15am Introduction to Charles Massy & to Groundswell Laura Fisher
10.25am Keynote presentation "Why Regeneration?" Charles Massy
10.55am The Earth Oracle; Artist Alex Wesser reflecting on 48 hour Fasting & Meditation in The Hole
11.25am Grey & Thespian Mardi Gras Talent Quest Session 1
12.05am Stories from the making of "2040" Damon Gameau
12.35pm Break for lunch
1.35pm Grey & Thespian Mardi Gras Talent Quest Session 2
2.15pm Express, Stretch & Refresh Karen Bishton
2.30pm Live music The Screaming Zuccinis
3.15pm "Why wild foods" - Artist Diego Bonetto
3.40pm Workshop on our future Charles Massy, Damon Gameau, Rachel Lawrence, Adam Blakester
4.20pm Concert AMBER LAWRENCE
5.50 - 7.30pm Pulse Campfire dinner
7.45pm at "The Roxy" film screening of "2040" Introduction by Damon Gameau

ALL DAY FOOD AND DRINK VENDORS, STALL HOLDERS, FUN AND FESTIVITIES FOR THE CHILDREN STORY TELLING, CRAFT, ART, PLANTING AND MUCH MORE

GROUNDWELL

WHERE ART, FARMING AND SCIENCE MEET

SATURDAY 7TH At The Groundswell Marquee

11.30am Artists of "An Artist, a Farmer and a Scientist walk into a bar"
11.40am Participants will rotate between:
- Wildfood Store - Diego Bonetto "how to turn your weeds into cash"
- The Humus House - Jono Bonitho/Laura Fisher/Glenn Morris
- experience what it means to behumus
- Carbon sequestration collaborative drawing: Georgie Pollard
12.40pm Break for Lunch
1.30pm "A day in the life of soil"
Performance by Imogen Semmler, Tim Cavanaugh & David Hardwick
3.05pm: "Mothers Little Helpers"
Premier of Karla Dickens film featuring Bruce Pascoe and Bingara school children, followed by a conversation with Auntie Sue Blacklock
3.35pm Return to the main stage - Workshop on our Future

SUNDAY 8TH At The Groundswell Marquee

7.30 - 8.30am Foraging walk with Diego Bonetto or Yoga on the Gwydir River with Karen Bishton
9.00am "The Art & Science of Adaptation": a talk by Charles Massy followed by a discussion with Ian Mills, Rachel Lawrence & Ananth Gopal
10.20 - 11.20am "The Innovators": A series of presentations by:
Sharon Winsor: Founder of Indiearth - the potential of native foods
Sarah Burrows & Anita Taylor: Founders of Red8 mobile abattoir
Lee Fieldhouse & Kirsty Hughes: Founders of Island Biologicals - the power of the earthworm.
11.20am Brunch
12.20pm "I'm walking on Sunshine" - the energy the sun gives us
- multiple topics across three art projects with:
Allan Yeomans, Lucas Ihlein, Georgie Pollard, Erica Watson, Hayden Druce, Bjorn Starnberg & Mark Swartz
1.35pm Landcare World Café - hosted by Sara Schmuide & Jill Moore-Kashima of Southern New England Landcare
2.45pm Wrap up: Garry McDouall Chair of The Carbon Farm

Pulse of the Earth - A Festival of Regeneration

MAJOR SPONSORS

COMMERCIAL SPONSORS

VOLUNTEERS The organisers acknowledge the huge contribution of the many volunteers & community groups without whom this festival would not have been possible.

DISCLAIMER: Whilst every effort has been made to ensure the safety of everyone attending & participating in this Festival, the organisers are not responsible for the management of children, or for individual behavior.



TOP: Flyer for *Pulse of the Earth* festival and *Groundswell* (2019). BOTTOM ROW: Images as they appeared in *Gwydir News*. Left: Bellydance Earth and Sky performers entertaining the crowds. Image supplied by Jemmah Richardson. Middle: Amber Lawrence performing. Image supplied by Jemmah Richardson. Right: "Jumping castle proved to be a hit"

regenerative agriculture will take off, it has the potential to become something of international importance, and TLC can be part of the answer in combating climate change," added Garry.

The kid's creative corner was also a hit with attendees, providing a safe space for children to play as well as create natural arts and craft, blast off on the jumping castle, or play with bubbles.

"Amelie Vanderstock hosted an engaging native bee demonstration with the kids and she was absolutely fantastic," gushed Garry.

"Amelie has hosted kids zones at other festivals and she said this was the best setup up and creative corner she had seen anywhere, which is a credit to the committee," said Garry.

The future plans of the festival have still

yet to be decided in a post event committee meeting but the future looks promising for *Pulse of the Earth*, according to Garry.

"We'd like to simplify the format, and host the event biannually; there is plenty of potential for growth for the festival."

The committee would like to thank Adam Stokes for emceeing the event, as well as all the major sponsors including Ryde Eastwood Leagues Club, Gwydir Shire Council, Drought Angels, PHN Hunter New England and Central Coast, Bingara IGA & Hardware, Regional Australia Bank, Northern Slopes Landcare, and the River House.

"We would like to thank and acknowledge all the volunteers who helped over the weekend as well as leading up to the event; it takes an extraordinary number of people who contribute to make events

like these possible," said Garry McDouall.

"Without the help of the sponsors as well as the community organisations such as Rural Fire Service, SES, Gym Committee, Bingara Lions, this event wouldn't have been possible."

The committee would also like to say a special thank you to the Gwydir Shire Council for their contribution.

"It was a joint effort and we couldn't have hosted such a successful event without their help. Working together is the only way events can succeed," concluded Garry.



Garry McDouall has been a merchant banker and a farmer, and is passionate about the future of farming and smaller rural communities. He was the inaugural President of *Bingara & District Vision 2020* which facilitated a community vision around "Regeneration", and he led the establishment of the first *Pulse of the Earth* festival.

Earthworm power!

LEE FIELDHOUSE & KIRSTY HUGHES



LEFT: One of Lee's giant worm casting (worm poo) harvest beds. RIGHT: A plant with a very healthy "rhizosheath". Photos: Kirsty Hughes.



We were invited to *Groundswell* as innovators in regenerative agriculture, to talk about "the power of worms".

We run a commercial worm farm on Oxley Island, NSW, and we think worms (specifically earthworms) are rad. They have five pairs of hearts, no eyes or lungs, are covered in hairs called setae that act like anchors, and when two copulate they both have offspring.

Objectively speaking they are also incredibly important animals for soil building and soil fertility. Their front end is an organic matter reducer and shredder. Their middle is an anaerobic bacterial fermentation system (kind of like the crock you make sauerkraut in). And their back end is a perfect biostimulant distribution system, depositing goodness straight to where it's needed at the plant root.

They have a gut which, like ours, utilises microbes to extract nutrition from what they ingest. It's also kind of like a chook's gizzard in that they swallow grit to physically grind what they've eaten. Their excreta contains some of these microbes plus their by-products (such as enzymes and hormones which stimulate plant growth), and a rich humus of stable carbon, all mooshed in with the sediment particles. Beautiful, healthy soil in other words! When compared to surrounding soil, worm cast has a huge amount of plant-available minerals: seven times more phosphorus, five times more nitrogen, 11 times more potassium, three times more exchangeable magnesium and one and a half times more calcium.

When we say they poo out some microbes, that's not an insignificant thing. Soil that has been through the gut of a worm has 10 to 20 times more microbes than surrounding soil. They are major proliferators of plant-relevant microbes. These microbes form the connection between the plant, soil and wider environment. In exchange for sugar (exuded from plant roots), they will even dissolve rock to make sure their plant has all the minerals it needs and create a blanket of perfect conditions around the root (called the "rhizosheath"). They tell a germinating seed which way is up,

and they help plants fight off disease and communicate with each other.

Even the tunnelling behaviour of earthworms is helpful. The movement of a worm through soil creates a 'macropore' which enables oxygen, water and water-soluble minerals to more readily enter the earth. It creates an easy pathway for plant roots to penetrate new ground—worms are able to dig through quite compacted terrain. Worms secrete a mucus to help them breathe, which adheres to the tunnels and helps stabilise them.

Not all worms tunnel, of course. Compost worms are the non-burrowing ones we co-opt to live in boxes in our backyards to help break down organic waste. They are brilliant upcyclers, to whom nothing is 'waste'. Well, almost nothing. As commercial worm farmers it's interesting to see what they reject. The lining of 'fully compostable' coffee cups, for example. They don't like glossy mags or coloured cardboard. They don't like plastics, including microplastics. And we've heard they steer clear of GM.

Compared to the magical alchemical abilities of worms, our innovation is very humble. We just feed them the good stuff and house them without too much

disturbance. We are specifically interested in collecting quality cast, so Lee built two big cast harvest beds. They are elevated off the ground with a cutter underneath, and the worms are fed at the top. He then brews the castings up like a big coffee, and we end up with a plant probiotic, or 'liquid vermicast biostimulant' we call *Biocast+*.

Our goal is to make this life-promoting worm elixir available to growing systems where it may be missing. Earthworm activity is low or absent where soils have been tilled, where there has been high use of synthetic fertilisers, where pesticides, including fungicides have been used, and where soils are bare, dried and compacted. It can also be low in pots and in green wall and hydroponic growing systems.

If you are growing plants in the ground you can encourage earthworms by using regenerative principles. The simplest principle is to aim for 100% groundcover, preferably living, and as diverse in species as possible. Limiting or excluding the use of synthetic fertilisers and pesticides is a major step too. And best to minimise turning, ripping or otherwise cultivating the soil. Wonderfully, the worms will help you to rely on these methods less and less, as they strengthen the plant, munch up

pathogens, and improve access to nutrients.

Until your worms recover though, or if you're not growing in the ground, there is *Biocast+*. It's complete with all the living, beneficial microbes, the enzymes, hormones, humic compounds and trace minerals... It just doesn't dig tunnels. You can, however, spray it on the leaf, which plants respond very well to! Our customers report back glossier leaves, less issues with pest and disease, better fruiting, robustness in the face of weather extremes, and general vigour. Their plants get more life.

And that's our motto—life creates life. Whichever way you go and grow, consider this:

The burrowing earthworm is Nature's own plough, her chemist, her cultivator, her fertilizer, her distributor of plant food. In every way, the earthworm surpasses anything man has yet invented to plough, to cultivate or to fertilize the soil.

George Sheffield Oliver, once considered the world's foremost expert on earthworms, penned these words in his excellently titled book *Friend Earthworm: Practical Application of a Lifetime Study of Habits of the Most Important Animal in the World* in 1941. Even with all the technological advances of the past 80 years, we believe that these words remain just as true today.

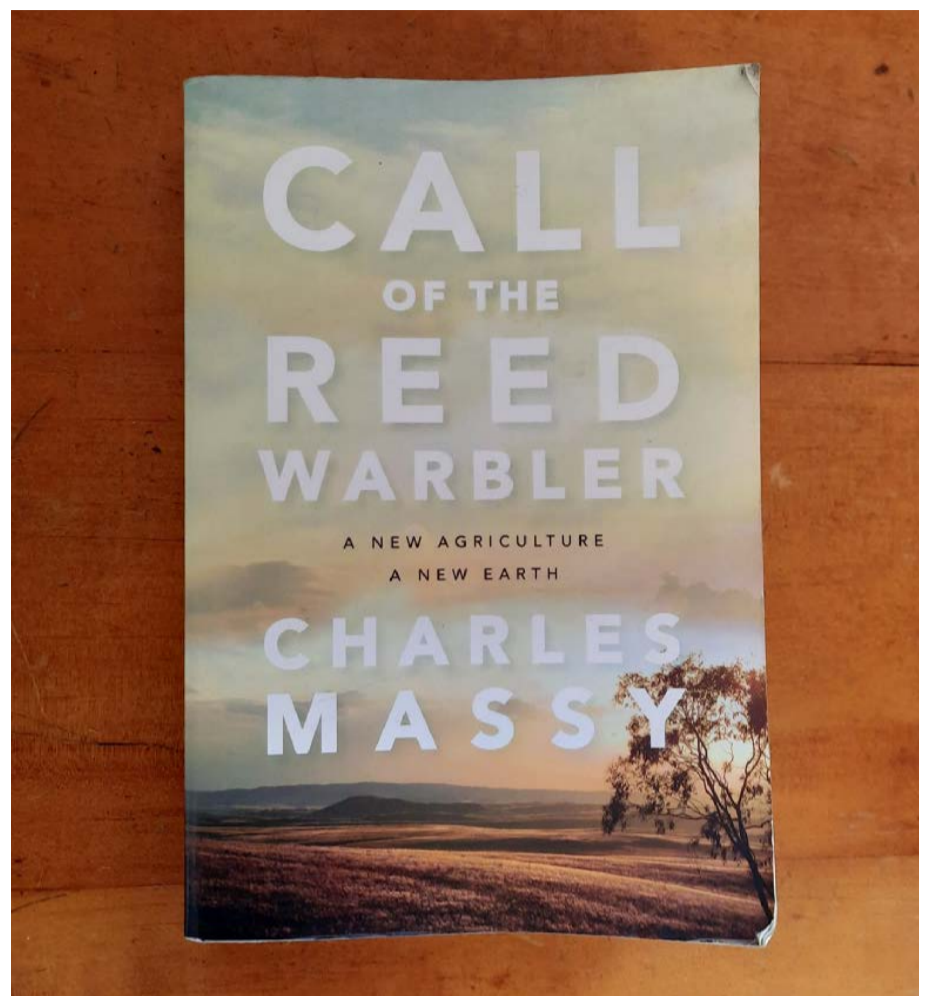


Lee Fieldhouse and Kirsty Hughes own and manage Island Biologicals. We believe that 'life creates life'. Our mission is to help Australian farmers embrace the complexities of nature and support the holobiont that is the plant, soil and microbe, for the benefit of all. We produce a high quality, natural biostimulant called *Biocast+*.

Keep a green bough in your heart

CHARLES MASSY

Charles Massy was keynote speaker at Groundswell and Pulse of the Earth. In this excerpt from his bestselling book Call of the Reed Warbler, Massy reflects on the importance of cooperation and symbiosis in the development of complex ecosystem communities, and the crucial role that farmers can play.



It was last summer at the end of a day's shearing, as I was following a mob of shorn merino hoggets up a lane from the shearing shed, when I was reminded of how powerful and fundamental the processes are within natural systems. At the top of the lane in an adjoining paddock of mixed bush, there are a couple of lovely candlebarks, surrounded by blackthorns and native grasses. As I passed these, mooching along behind the sheep with my dogs, I suddenly heard an awful scream coming from the vicinity of a candlebark. I had heard rabbits screaming when caught, but this was different: a piercing sound of sheer terror by some poor creature.

I climbed the fence to investigate, but then stopped. Two metres in front of me was a three-quarter-sized rabbit in the entrance to a burrow. But around it were three coils of a large brown snake, whose head rested on the rabbit as it gazed at me with those dark, glittering and implacable eyes that send a thrill through one's backbone. Clearly it was waiting for its venom to take effect, while the rabbit continued screaming.

I left prey and predator alone, and as I walked back to my dogs and sheep, the words of Tennyson sprang instantly to mind: that nature was "red in tooth and claw". However, as I continued slowly following the sheep, I thought about the incident. Yes, Australia had its share of fierce predators, yet this "jungle law" (what Herbert Spencer in the nineteenth century coined the "survival of the fittest") wasn't the only mechanism operating Down Under.

In fact, for life on Earth in general and the process of evolution in particular, collaborative symbiosis and forms of mutualisms are fundamentally integral mechanisms. In their seminal book *Microcosmos*, Lynn Margulis and Dorion Sagan powerfully reveal that, "in contrast to the usual view of neo-Darwinian evolution as an unmitigated conflict in which only the strong survive", evolution is as much "symbiotic and interactive". There is, they concluded, a very "thin line

between evolutionary competition and cooperation".

Today, as a result of their and others' work, we now know that much of the history and evolution of life is symbiotic: that a lot of the major evolutionary jumps in life on Earth have come from symbiosis. Much of this is via bacteria, given, as Margulis and Sagan reveal, that life on Earth "has been largely a bacterial phenomenon". This has involved different forms of life being ingested or captured by others, but them then working together to form new organisms or organelles with new, enhanced functions. That is, all present and past life forms (including we humans) are the result of these extraordinary collaborative arrangements.

As Margulis and Sagan challengingly put it, the very fact our own cells maintain the carbon—and hydrogen—rich environment that existed when life began billions of years ago ("a medium of water and salts like the composition of the early seas") reveals that "we coexist with present-day microbes and harbor remnants of others, symbiotically subsumed within our cells. In this way, the microcosm lives on in us and we in it." Thus we and all living creatures are nothing but evolutionary mosaics of microscopic life. And it all began with bacteria.

Crucially, due to Australia's ancient history, our leached soils and scarce nutrients have stimulated a whole raft of unique collaborative arrangements to better share such scarce resources. This includes arrangements between birds and plants; bacteria and mycorrhizal fungi and plants; insects, bacteria and fungi; placental mammals, marsupials and microbes; honey possums or honeyeaters and flowering plants; cooperatively breeding birds, and so on. That is, Australia can boast—via cooperation, symbioses and mutualisms—an extraordinary and long-coevolved variety of organisms working together for mutual survival. This Gondwanan ark truly was and is like no other place on Earth.

...

A dynamic ecosystem can be described as a complex community of organisms in any locality that, while being in a state of relative "balance", is nevertheless in constant flux and interaction—thus dynamic. Many ecologists, including Allan Savory, regard this function—the dynamics of healthy biological communities—as the most vital of all. The way diverse and dynamic healthy biological communities sustain themselves varies with each different environment, characterised by differently marvellous and complex processes.

The detailed attributes of dynamic healthy biological communities will not be dealt with here as they already fill many textbooks. But as we continue on this journey, I will be touching on a number of the most crucial and general principles that modern systems ecology is coming to understand. These include the fact that all living organisms are adapted to their own specific environment through a process of coevolution, and when they become established in a community they alter their surrounding microenvironment. In turn, they are altered by their environment again.

The result is a community that consequently develops over time as a dynamic whole. To paraphrase John Donne, no organism is an island, entire unto itself. If such a complex, interconnected and interdependent environment is then altered—for example, by inappropriate farming practices—then such actions can have huge and unforeseen consequences. Conversely, when regenerative farming practices enhance dynamic, interacting ecosystems, then they become more resilient as complexity increases.

Linked to this in turn is the fact that most biological activity occurs underground: a crucial point when we consider the role of the key landscape functions. Further connected to this is the importance of another observed principle: that in a healthy, evolving or regenerative landscape or ecosystem the process of change tends to be one of "succession". This means both a gradual and often staggered build-up of species

diversity and biomass, in combination with changes in the microenvironment. As we have seen with Tim Wright, Colin Seis and Bruce Maynard¹, due to revived landscape health, long-buried grass seed from valuable grasses that disappeared after white settlement have been brought to the surface by 'ecosystem engineers' (insects, earthworms, reptiles, burrowing mammals et cetera) to germinate and begin to restore diversity and functional integrity in modified landscapes.

The huge problem with conventional industrial agriculture—indeed with agriculture going back ten millennia and more—is that it is about the simplification of ecosystems. This is still the dominant mode of global and Australian agriculture, notwithstanding the fact the examples in this book reveal that a profitable, productive and sustainable agriculture is possible by working with and not against ecosystem functions.

Call of the Reed Warbler was first published by Queensland University Press in 2017.

1. These regenerative farmers are discussed in detail in Massy's book, *Call of the Reed Warbler*.



Dr Charles Massy (OAM) is the author of the award-winning *Call of the Reed Warbler* and many other publications. He has managed his family's grazing property for 40 years and held several senior roles serving the Australian wool industry. Charles teaches and consults in the fields of Merino breeding, landscape design, and regenerative agriculture.



TOP: Members of KSCA with farmer Tim Wright at his property Lana, near Uralla, 2017. BOTTOM: Charles Massy presenting at *Pulse of the Earth*, 2019.



A day in the life of soil

DAVID HARDWICK INTERVIEWED BY LAURA FISHER

Agroecologist David Hardwick is in demand across the country as a soil educator, largely because of his brilliant role-playing workshop ‘A day in the life of soil’. At *Groundswell*, Imogen Semmler adventurously teamed David with soil scientist Professor Timothy Cavagnaro to give the workshop a different flavour. Everyone took great pleasure in communing as microbes and nematodes. It’s well worth listening to the event podcast (www.k sca.land/resources).

In March 2020 I interviewed David to learn about how the workshop came to be.

How did the role-play method come about, what sparked that idea?

When I was working in the soil conservation office at Landcare, I used to attend field days run by the soil conservation service team. I noticed that they were very hands on, and they weren’t as academic as the DPI guys (Department of Primary Industries). They were far more collaborative with farmers. I could see how they used props and realised that props were a really important way to teach.

Then I was in another role in Landcare where I had to run an Indigenous cultural awareness project with the farmers in the Eastern Darling Down. There was an Indigenous cultural awareness officer from Brisbane whose name I can’t remember unfortunately, who we hired to run a workshop in Toowoomba, just in the beer garden of a pub. He rocked up, lovely guy, wore a shiny suit, and I thought “oh this is not going to go down well”. Just because of the way he looked—this was

a conservative rural area. But he was an extremely capable guy and he got us initially engaged very powerfully and then he role-played us for about two hours. He turned us all into Indigenous Australians and role-played a first contact story, based on a true story. He turned us all into desert tribal groups, and we role-played pre-European contact, then European contact and then post-European contact. And the way they worked, the missions, the alcohol. We had to live through that experience. It was an extremely powerful experience. I never forgot it, and everyone else there, no matter which side of the fence they sat on, they never forgot it.

And you said you first tested the idea when working for a biofertiliser company, where you had to engage people on the importance of soil and how these biological products worked.

The main way people teach you about soil health is powerpoints, they just kill you with powerpoint presentations. And everyone’s been through that, including me, and I just thought “well, if old mate could do it as a role play for that topic on Indigenous culture, then soils can’t be too hard!” So I cooked up a little role-play, with a plant and photosynthesis and a community of things that live around that plant’s roots. I got a few cards, some lollies, and gave it a crack!

What sort of reception did you get?

I pretty quickly realised it was a very effective tool for learning. I got really good

feedback, it was engaging and humorous. I realised I was on to something, so I just kept fine-tuning it over the next couple of years.

It’s got Chapters or Acts, if you like, which blur into each other. And if people ask questions you can take the role-play wherever you want, the role-play is a very dynamic, fluid, flexible thing. So, if someone asks a question on carbon you can just go for half an hour down the carbon path.

Talk me through the five acts.

They are:

1. Enter carbon: the giver of life i.e. photosynthesis
2. Symbiosis: the great relationship begins
3. Minerals: fertility from the earth
4. The great banquet: organic matter decomposes
5. Humus emerges

These are all concurrent processes aren’t they, there are certainly beginnings but it’s all quite entangled isn’t it?

It is, and with farmers in a small group, it can be more circular than linear, and we can have it go for three hours. We can also contextualise it for single nutrients, so we might have a day just where we look at phosphorus or nitrogen.

I’ve thought a lot about why it’s so effective as a way of getting engagement about soils, because I’ve been to other role-play activities that don’t work, because people feel really awkward. My conclusion

is, most people don’t like being actors – I know artists do but most people don’t. So if I said “oh I want you to be the bank manager in town, or the livestock dealer”, a lot of people feel awkward when you ask them to act someone that they know. There are a number of inhibitors. But when you ask someone to be a bacteria, it’s so far removed from the human world that they don’t mind.

The thing about Australian farmers, and I’m generalising because there are a lot of exceptions, is that many of them don’t have a lot of understanding of soil because they never had the opportunity to learn more about it. Or if they did go through uni and studied Agricultural Science, the way the soil topics were taught were really boring. Soil is never really practically taught; it’s very theory-based at uni.

Is it true to say that farming has become very procedural—you go to the Agriculture store, you have a problem, they advise you, you buy a product...?

Yeah it’s quite common that, because farmers don’t understand it, it is left to agronomists. The farmer trusts the agronomist. It’s a bit like how some people leave their financial decisions with the bank, or the broker... That’s the analogy I use.

Is climate change an accepted reality among the farmers you speak to?

Yeah it is. You do get sceptics, and it’s good to have scepticism I think. Most people see at a regional scale that their yearly climate



"A day in the life of soil" participatory performance at *Groundswell* 2019. Photos: Lucas Ihlein.

is changing, particularly the heat, how rain falls, and when it falls. I was just doing a job at Gundagai with a group. The father of one of the guys was hanging around and having a listen. At the end of the day I said hello. We were just having a chat and I said "how's it going down here?" And he said "we used to bank on spring. You can't do that anymore". So spring was a guaranteed growth time and you'd make money. He's probably 80. They're all trying to adapt and evolve.

You've got people all across the spectrum... You've got to be very wary when you rely on nature. Your thinking has to be very cautious. You're at the vagaries of climate, natural disasters, diseases. You know, are the dingoes getting in and wiping out 60% of your lambs? That sets you back three years cash flow. But that's different to conservatism. Farmers have to wait to observe something, they have to. Most farmers use the scientific method: they do something, they see the results, they reflect on the results, they come to a conclusion, and then they change if needed. But they don't do it really quickly.

A few years ago I was looking at Facebook's motto "Move Fast, Break Things", and thinking about how inappropriate it was for Regenerative Ag. I'm not saying people don't want to change things, but you don't want to break things. Because you depend on that landscape. So farmers are inherently very cautious. The only time they throw caution to the wind is when they have no choice. Regenerative farmer Col Seis is a great example—Col's place was burnt to the ground, he was in the middle of a drought, he had no more

money. At that time, he rolled the dice, he said, "I've got nothing to lose". That was the seed of his revolutionary practice of pasture cropping. A lot of farmers would have lost the farm at that point.

A lot of people feel awkward when you ask them to role-play someone they know. But when you ask them to be a bacteria, it's so far removed from the human world that they don't mind

People say farmers need to change, but changing the farm—you have to remember it's a complex system: it's a business, it's a landscape, it's animals, it's plants, it's water. It's more complex than most other business systems because it has a landscape as well as climate, whereas most other businesses don't have those elements. It's not really easy to do the change.

You've worked with farmers in so many different scenarios. If there were more resources for farmers to change, how do you think it would be best channelled to make it possible for people to adapt?

For me it's pretty simple. We do now have enough knowledge and information from behavioural psychology and other fields about what leads us to make change. To get someone to adapt, they have to feel confident. The angle I came from is that we need to strategically help build capacity in farmers and farming communities. That

has four stages:

The first one is getting people positively engaged on the topic. The role-play is a good example of that.

Step two involves building fundamental

understanding around that topic. So people have the basics.

Step three is "What are the relevant skills I need to manage better? Now that I accept I've got to maintain soil health, what do I do next?" And the answer would be "you've got to be able to read a soil test confidently and you've got to be able to assess your soil in the field and make some decisions: do I add lime, or do I add compost, or do I use cover-cropping?"

And step four is: feel confident to make decisions. That usually works by farmers going to visit other farmers that have already been through that decision. The really powerful approach is peer-to-peer learning or "communities of practice" learning. Then farmers are listening to other people's stories on how they made decisions. It's a low-risk way to practise decision-making without spending \$50k and getting a whole lot of it wrong.

When you take people through those four steps, they will automatically

innovate, change, adapt. They will do it for themselves, I guarantee you. Those four steps, they come out of Bateson's adult learning principles, I've just tweaked it. You see, few people have built the capacity in Australian farmers to understand their landscape better. It's been a cultural problem in agriculture over many decades: you control, you dominate, you modify, but you don't understand for health and long-term productivity. No-one is trained in ecology. My real challenge is to build ecological literacy, or agroecological literacy in farmers—it's my main passion in life.



David Hardwick is an agroecologist with over 20 years' experience in rural landscapes, farming and food systems. The founder of Soil Land Food, David delivers soil health and farm planning workshops and training programs around the country, with the goal of supporting farmers to build a more regenerative, ecological future.

Myall Creek Memorial

MYALL CREEK MEMORIAL COMMITTEE



20km north-east of Bingara is the site of the Myall Creek Massacre, where 28 Wirrayaraay people were killed by white men on 10 June 1838. 11 of the 12 perpetrators were tried in the Supreme Court and seven men were eventually executed for their crimes, an exceptional event in the colonial justice system which otherwise turned a blind eye to frontier violence. In 2000, the Myall Creek Memorial was created at the location of the massacre by a group of Indigenous and non-Indigenous Australians. For many people it has become a place for contemplation and healing, where we can reflect on our history and future as a country. Among those who worked incredibly hard to establish the memorial in the spirit of reconciliation is Nucoorilma woman and Tingha elder Auntie Sue Blacklock (AM), a descendent of one of the survivors of the massacre. Auntie Sue has dedicated her life to supporting Aboriginal children to thrive and retain strong links with their families and communities. At *Groundswell* we were fortunate to have Auntie Sue join us to speak to the audience following the presentation of Karla Dickens' video *Mother's Little Helpers*, which was partly filmed at Myall Creek.

Printed here is the text inscribed into the eight commemorative plaques that people encounter when they visit the Memorial. The language is Gamilaraay, paraphrased

in English. We thank the Myall Creek Memorial Committee for allowing us to reproduce this text here:

1. Giirr ngurrmbaa, walaaybaa nhalay Wirrayaraaygu Gamilaraaygu.

From time immemorial, the Wirrayaraay tribe of the Gamilaraay lived here, caring for the land and harvesting the animals, fish, root crops, grains and fruits in a seasonal cycle. The identity of the Wirrayaraay derived from their spiritual relationship with the land.

2. Yilambu Wandagu dhaay dhimba milambaraay ganhi.

In the 1830s European squatters began to send their servants into the district to establish cattle and sheep stations, occupying the land and using its grass and water resources to feed their stock.

3. Yilaa Mari Wanda bumalalanhi; balunhi burrulaa Mari gulbirr Wanda.

Conflict soon arose as the Europeans forced the Wirrayaraay off their ancestral lands, drove them away from creeks and waterholes and seized Aboriginal women. The Wirrayaraay retaliated by spearing

stock and attacking the stations and their personnel. Revenge killings began.

4. Burrulaa Mari gandjibalu, bawurragu bumaay.

Towards the end of 1837, parties of European stockmen and station hands, encouraged by a punitive expedition of Mounted Police sent from Sydney, embarked on a bloody rampage throughout the region, hunting down and killing any Aboriginal people they could find. Hundreds of Aboriginal people were slain.

5. Wirray bumalalanhi gulbirr Mari Wanda; ganunga maliyaa ginyi.

In May 1838, a band of Wirrayaraay people took refuge from this onslaught on Myall Creek station below, at the invitation of one of the station hands. For the next few weeks they lived in peace around the station huts, and convivial relations were developed between them and the four-man staff.

6. 10 Djun 1838-ya burrulaa Wirrayaraay yinarr, gaay, wayama balunhi; giir bilaarrdhalibaa nhama mari.

On 10 June 1838, a gang of stockmen led by a squatter rode into Myall Creek Station and brutally murdered about twenty-eight

unarmed women, children and old men. The younger Wirrayaraay men were away cutting bark on a neighbouring station.

7. Nhama gagil Wanda gaabamandu bumaay. Yilaa Wandagu burrulaa Mari bumaldanhi.

Eleven of the twelve men who carried out the massacre were arrested, tried and acquitted. In a second trial seven of them were found guilty and executed. The squatter involved was never brought to trial. This was the first time that white men had been executed for murdering Aboriginal people. However this did not end the massacres. They continued throughout the continent, often unreported, until the 1920s.

8. Ngiyani winangay ganunga

In memory of the Wirrayaraay people who were murdered on the slopes of this ridge in an unprovoked but premeditated act in the late afternoon of 10 June, 1838.

Erected on 10 June 2000 by a group of Aboriginal and non-Aboriginal Australians in an act of reconciliation, and in acknowledgement of the truth of our shared history.

We remember them.



TOP: Members of KSCA visit the memorial in 2017. BOTTOM: Auntie Sue Blacklock and Karla Dickens at *Groundswell* with some of the children who feature in Karla's film: Sharkiah Dixon Toomey, Lashaya Dixon Toomey and Tamimya Bloomfield. Photo: Vickie Zhang.

Going down fighting

IAN MILLISS



From left: Gilbert Grace, Alex Wisser, Imogen Semmler, Georgie Pollard, Ian Milliss, Jonathon Bolitho & Laura Fisher. Public talk at KSCA's "Art Farming and Cultural Change" exhibition, Lyttleton Stores, 2019. Photo: Fiona Davies.

I arrived at *Groundswell* in the middle of Saturday. The trip unfolded like a sort of disaster tourism, although now I realise it was simply the curtain raiser for a whole summer of disasters. I had delayed my arrival in order to attend the Friday night opening of Kaldor Public Art Projects' fiftieth anniversary exhibition at the Art Gallery of NSW and the contrast between that—the Sydney art world at its grandest—and the scene in Bingara could not have been more striking. My early morning plane to Tamworth was delayed for hours by strong winds that partially closed Sydney airport, but as I flew in over farm dams that were little more than damp muddy patches, bushfires visible in the distance, I started to get the picture that this was not going to be the weekend I had expected. By the time I arrived in Bingara there was still dust swirling in the air from the previous day's storm and that peculiar atmosphere of strange elation that comes with wild weather and disruption.

This atmosphere wasn't the only reason the weekend felt so different to the Kandos School of Cultural Adaptation's previous *Futurelands2* conference, held in Kandos in 2016. *Groundswell* felt more interactive, more a series of workshops, experiments and discussions than the forum lectures of the preceding event. It reflected the varied background of the projects that had been completed in the intervening years, and the fact that KSCA increasingly exists as an effective player, albeit still a small one, in the debate around practical management of climate change.

I was on the panel, "The Art and Science

of Adaptation" with Charles Massy, Rachel Lawrence and Ananth Gopal. This session discussed adaptation in real world scenarios, cutting across different fields. It was an interesting panel, and I have no doubt that many people came away from the weekend as a whole with new ideas and renewed hope. But the origin of that hope, unfortunately, cannot be attributed to me, as probably my only real contribution was to put a dampener on such sentiments. Among the more optimistic scenarios offered on my panel, I found I had to make the point that, more likely than not, it was all too late. Like a terminal patient, perhaps all that was left to do was to accept imminent death and "to smooth the pillow of our dying race", to rephrase the patronising phrase used by nineteenth century white Australians to rationalise their failure to prevent ongoing genocidal attacks on Aborigines. I confess that I was a bit shocked at the reaction; it was only then that I discovered that some people have never seen human extinction as a possible ending to the climate crisis.

Some people have never seen human extinction as a possible ending to the climate crisis

So, let's get some basic facts together. We have now reached a level of atmospheric carbon dioxide not seen for around three million years, a time when hominid species had barely appeared. And despite endless international meetings and agreements, the amount of carbon dioxide we are putting

into the atmosphere continues to rise rather than fall. The warming climate is melting permafrost, releasing even stronger greenhouse gases like methane in a positive feedback loop. In other words, even if all human-generated carbon dioxide ceased tomorrow, we have already guaranteed the continued release of gases that are predicted to send planetary temperatures several degrees higher, enough to make it unlivable for most existing life, including human life. That's why I think it's all over.

On the other hand, I think recognising that it is over for us might actually concentrate our minds and human ingenuity a bit. Political talk of "net zero emissions by 2050" is all flim flam, another procrastination tactic designed to make no action look like some action. We need far more than the reduction of emissions in a few decades—we need the immediate reversal of emissions, *now*. More than just "net zero", we need technologies to start clawing carbon dioxide out of the atmosphere and we need

trees, grasses and the soil—and we need technologies that can sequester carbon in stable physical forms, so it can be returned underground. These technologies, which already exist at experimental stages, can be powered by using increasingly cheap and abundant renewable energy systems—ones that we have developed in a comparatively short period of time, systems that prove what we can do if we have to.

This would all need to be done on an enormous scale, in a race against time. It is, admittedly, a race that I believe we as a species will ultimately lose. But I think we owe it to the rest of life on the planet to go the extra mile, to at least *try* to limit the damage, to provide some base from which a new ecology can grow, hominid or not.

Do I think this will happen, even though I think it is possible? No, I don't. But I like to think that eventually—much, much too late—some humans will try.



Ian Milliss began exhibiting in 1967 as one of Australia's first conceptual artists and developed a practice based on cultural activism. He has worked in the Green Bans, prison reform and trade union movements and has dealt with a wide range of cultural issues including sustainable farming, heritage and climate change.

Regenerating earth, landscapes and communities

RACHEL LAWRENCE

At Groundswell, Rachel Lawrence spoke on a panel titled “The Art and Science of Adaptation.” In this article, Rachel expands on a range of ideas which emerged during that discussion, outlining a pathway towards regenerative farming cultures of the future.

Regenerative agriculture is inspiring people across the globe, supporting local communities and biodiversity, and perhaps even drawing down carbon. It is likely to be a major tool to help us navigate a challenging future.

What does “regenerative” mean in agriculture?

Regenerating is building and renewing. In agriculture, when farmland is managed “regeneratively”, natural ecological processes are restored. Ecosystems on regenerative farms are reorganised, so that they move towards self-sustaining states that are better able to ride out challenging climatic events. In contrast, many industrial agricultural practices degenerate and degrade natural functions, resulting in systems that lack resilience. Such systems struggle to function without substantial outside assistance from machinery, agrochemicals and even social support for people’s wellbeing.

Of course, there’s a lot going on between these two extremes. Modern agricultural and ecological sciences do contribute invaluable knowledge that can be of benefit to both humans and the environment. As well as increasing the efficiency of production of essential food and fibre, science can support farmers and natural resource managers to protect ecosystems if the will and resources exist.

In reality, farmers face economic and cultural pressures that constrain their uptake of evidence-based, “best-practice” strategies. Siloed approaches to science and agronomic research mean that the

complex, creative systems that underpin agriculture are rarely treated holistically.¹ Consequently, agricultural research around natural ecology (agroecology) has received much less attention than industrial approaches.²

Siloed approaches to science and agronomic research mean that complex, creative systems that underpin agriculture are rarely treated holistically

The lack of momentum for regenerative approaches is also caused by an economic system that strives for economic growth, with wealth landing in the hands of a few. This creates massive inequity in resources amongst people, and it also causes great inequity between human and non-human life forms. Non-human life-forms have their own intrinsic value, but they are also essential to human wellbeing, because they sustain essential ecological functions within the agroecosystems that make human life possible.

Harvesting light: building regenerative systems

Contemporary agriculture has sought to maximise production of food and fibre for human needs. The agricultural industry consistently prides itself on efficiency and increasing productivity. This is seen as paramount to successful agriculture, but it

also amounts to taking as much as we can for ourselves, while leaving very little for other life.

What exactly is the job of farmers? From one point of view, it’s very simple! They nurture the conditions that support

ecologically based, regenerative systems are characterised by diverse, living systems that are much less reliant on sources of energy beyond contemporary sunlight. The difference between these approaches has huge implications for the emission, and conversely the drawing down, of carbon from the atmosphere.

If we want systems to regenerate and self-organise, and to smoothly ride out challenging ecological conditions, some of the sunlight energy that comes into a farm ecosystem must be left unused by us. This allows biological diversity to flourish, which leads to plant life being able to capture more of that energy, regenerating more life and the services it provides.

Many practices that can regenerate agroecosystems are well understood. For example, it’s important to maximise ground cover in grazing systems, retaining good amounts of forage and litter to protect soils. Monitoring vegetation and altering stocking rates enables this and also sustains diversity. Ensuring that the number of livestock is kept below a paddock’s long-term maximum carrying capacity is also robust science in the sustainable management of grazing systems across the world and is good economic management.⁴⁻⁵ Rotational grazing is also widely promoted as a regenerative practice, and there is no “magic” in it. Carefully controlling where animals graze is key to achieving the balance between sustainability and productivity, and moving animals regularly enables the farmer to observe plant recovery and regeneration. Strategic periods of rest can then be applied to encourage regeneration in particular





A reach of Roumalla Creek on Tim Wright's property Lana, near Uralla, NSW. At this place, a wide variety of wildlife is regularly seen including platypus, turtles, water dragons and abundant birds and insects. This area is grazed for only a few days each year as a part of the regular stock rotation. Photo: Rachel Lawrence.

areas of land.

In cropping systems, incorporating cover-cropping regenerates soils, encouraging lifeforms (vertebrate, invertebrate, microbial) that depend on the soil and the soil-plant interface. Strategically planting non-crop vegetation, using multi-species crop mixes and integrated pest management practices also nurtures a diverse agroecosystem, ensuring a range of ecological processes are supported. These processes build biodiversity, from bacteria and fungi in soil, to protozoa and worms that feed on those bacteria and fungi. They also sustain insects and other invertebrates that feed the vertebrates that are our treasured wildlife—and act as pest control agents. These animals all cycle nutrients through landscapes, but to do that they need places to move between and hang about in—safely and securely.

There are other methods that help to regenerate life and ecological processes and conserve precious biodiversity on farmlands. These include protecting ecologically sensitive areas such as creeks, rivers, wetlands and areas with intact and regenerating native vegetation. It's also good to leave dead trees with hollows intact, and logs and woody debris on the ground where possible. It might be appropriate to incorporate practices like agroforestry. In addition to generating alternative agricultural products, these practices support greater diversity of life, and with diversity comes resilience and regeneration.

Of course, all of this has to be done within the practical and logistical

constraints of running a business.

Transitioning to a regenerative farming culture

Clearly there are many well-understood and highly effective regenerative, or “best-practice,” ways of regenerating farm ecosystems. There are also experimental and innovative practices that haven't yet been studied by science but are considered to be highly effective by farmers. These practices might involve multiple interacting factors, or they might take place over very long periods of time, beyond the limits that scientists can reasonably explore. Indeed, some are hypotheses that may not be tested in the foreseeable future due to complexity and a lack of available resources, and are thus beyond the current reach of scientific inquiry. Rather than looking just to science, then, sometimes it may simply be a case of putting together the pieces of a scientific and broader social and ecological puzzle.

Right now, we need to accelerate the uptake of regenerative agroecological practices and conserve what remains of natural biodiversity in farmed landscapes. There are new methods of observation emerging that can account for the condition of farm ecosystems. This has the potential to rapidly accelerate the uptake of regenerative practices by creating data that accurately captures where regeneration and degeneration are occurring, and supporting and enabling people to make necessary changes.

Many regenerative practices will benefit farm businesses as well as the rest of us. Of course, carbon drawdown offers

massive potential public benefit, as does protecting remaining biodiversity. Farmers therefore deserve support to implement regenerative practices. Public support can come from a range of sources, including payments for carbon sequestration and for biodiversity conservation, as well incentives for regenerative practices like specialist loans, reduced interest rates, and access to premium regenerative markets. An additional possibility is philanthropic support.

While innovators are likely to keep pushing boundaries to find new regenerative methods, we already have many approaches that have proven their worth. Probably the greatest regeneration across farm landscapes will come from implementing tried and true practices that protect valuable biodiversity—both below and above ground. To do this on a large scale, farmers need to be supported: economically, culturally, and with information. Given these factors, farmers can become leaders, encouraging a diversity of life to flourish within the complex and variable agroecosystems they manage.

1. Provenza, F., Pringle, H., Revell, D., Bray, N., Hines, C., Teague, R., Steffens, T., Barnes, M. (2013) 'Complex creative systems: principles, processes, and practices of transformation'. *Rangelands* 35, pp. 6–13.
2. DeLonge, M.S., Miles, A., Carlisle, L. (2016). 'Investing in the transition to sustainable agriculture'. *Environmental Science and Policy* 55, pp. 266–273.
3. Mang, P., Reed, B. (2018) 'Regenerative

- Development and Design'. In: Meyers, R.A. (Ed.) *Encyclopedia of Sustainability Science and Technology*. Springer-Verlag: New York.
4. Michalk, D.L., Kemp, D.R., Badgery, W.B., Wu, J., Zhang, Y., Thomassin, P.J. (2019) 'Sustainability and future food security—A global perspective for livestock production' *Land Degradation and Development* 30, pp. 561–573.
5. Frasier, W.M., Steffens, T. (2013). 'Stocking rate decisions are not related to what you paid for your land or pickup' *Rangelands* 35, pp. 14–21.



Dr Rachel Lawrence completed a PhD at University of New England in 2019. It examined the sustainability aspects of rotational grazing and the potential to regenerate ecological function alongside production outcomes in grazing systems. She currently works with farmers as a Landcare coordinator and is helping to develop natural capital accounting frameworks.

Red 8 Produce

SARAH BURROWS & ANITA TAYLOR

Sarah and Anita from Red 8 Produce inspired the punters at Groundswell and Pulse of the Earth festival with their invention of a mobile abattoir to support farmers to humanely process meat on their farm. In this article they explain how their system works.

The Red 8 Produce lightweight mobile abattoir system is a new way of processing meat. It is better for the producer, the animals, the consumer and the planet.

Red 8 Produce began when we wanted to protect our animals from the stress of transport, sale yards, feedlots and traditional abattoirs and allow them to live their whole life on the farm. We identified that in the traditional system the quality and worth of their animals was being lost in terms of weight, bruising and stress.

We live on properties in the Northern Tablelands of NSW. Our families consider themselves custodians of their land, producing naturally reared cattle and sheep in a sustainable, low stress environment. If we could bring an abattoir to our own farms, we would produce higher quality, additive-free meat, which has been processed ethically, sustainably, with full and open traceability and reduced supply chain inputs. We would have lower costs and get a higher price for our stock.

Worldwide there is a growing market of consumers who wish to be assured that the meat they choose has come from animals that have been raised in a free-range environment without the use of antibiotics or hormones. They desire consistent, transparent visibility of this in

a high-quality product. The current supply chain does not actually make this possible.

In the current system there is limited financial reward for good animal-welfare, none for sustainable land care, and little connection between the farmer and the consumer. Producers must pay for transportation, levies and insurance. They suffer the penalties imposed by traditional abattoirs if the animals have lost weight (due to stress and time without food and water) or if the meat quality has been affected by bruising and depleted glycogen levels.

In the current system, there is limited financial reward for good animal welfare or sustainable land care, and little connection between farmer and consumer. We are trying to change that

Producers who elect to sell their own branded meat struggle to access abattoirs who will accept small animal mob numbers, or are capable of processing to export regulations. Transport and processing costs are high and absolute traceability is not possible.

Working with regulators, farmers, engineers, fabricators and meat processors in Australia and overseas, we have developed a unique, flexible, commercially compliant, mobile abattoir system that has wide application in the red meat supply chain.

The Red 8 Processing System can be used to slaughter on-farm or to service

a network of farms. Lightweight and modular, the system is easily transported to the farm, providing a viable alternative to traditional large-scale abattoirs. This eliminates the hazards associated with live-animal transport such as lost weight, bruising and injury - for which producers are penalised. Animals do not face unnecessary stress, thereby minimising depletion of natural glycogen levels. This results in higher quality carcasses and meat of better tenderness and taste.

By being able to process on-farm, the system also increases direct returns to

producers. Bypassing the saleyard or online auction system, the Red 8 Processing System enables producers to reduce inputs and increase farm returns. It also enables producers to share skills, infrastructure and resources to eliminate many steps in the supply chain, operating within their local community.

Most producers have at least two species of animal on-farm along with the potential to harvest their feral/game burden. The Red 8 Processing System has multi-species capability, enabling diversification at the farm-gate.

The Red 8 system could also be used in times of disasters like drought, fire or

flood when animals cannot be trucked due to poor condition. Rather than disposal on-farm, the animals could at least be used to produce pet food and so give farmers some return.

The Red 8 Processing System is a step-change for the meat supply chain and creates a new meat speciality product. It is comparable to the disruptive introduction of free-range chicken and eggs.

Red 8 Produce has recently received a federal grant and expects to be up and running in 2021. If you are a producer interested in learning more, or a consumer interested in product stockists, email red8@red8produce.com.au to join our mailing list or contact us through our website red8produce.com.au.



Sarah Burrows and Anita Taylor are the founders of Red 8 Produce, a mobile abattoir system. With the welfare of their farms (The Hill and Balala Station), families and livestock at heart, they have developed a new way of producing meat, enabling on-farm commercial processing at scale.



Sarah Burrows and Anita Taylor with the Red 8 Processing System. Photo supplied by Sarah Burrows

Community Weathering Station

JENNIFER HAMILTON



CoWS at Groundswell, 2019. Photo: Jennifer Hamilton.

Groundswell is burned into my memory in the same way as bathing at midnight in Sydney’s Redleaf pool. The swim I refer to was maybe in 2010 or 2011. We had been out drinking in inner Sydney and decided, as it remained 28 degrees and humid, that conditions were perfect for a midnight swim. At the time it felt bacchanalian rather than ominous. I was with my most successful, intelligent and attractive friends and I felt like the world was my oyster. It had never been that hot at night before and I guess we assumed it never would be again. This was the kind of evening that you’d watch in a movie and think: “I want that life”. In retrospect, the memory is still joyful but its meaning has shifted. Looking back on that day, as sweltering summer nights in Sydney normalise, it has become a personal watershed. We didn’t know it yet back then, but this was a climate change party.

The trip to Bingara to set up the inaugural *Community Weathering Station (CoWS)* experiment has taken on this similar feeling, only much more quickly and with a less pleasurable origin story. We drove to Bingara through a dust storm, behind water trucks, in apocalyptic howling wind. It was a powerful confrontation with the realities of the current drought, and climate change. As the opening festivities pushed on, the question “when do we pull the plug?” hung over us. We pressed on. When our friends’ tent was taken by the wind and they had to share our motel room at the Fossiker’s Way, the hotelier didn’t charge us extra for the three additional humans that night. Bingara’s first climate refugees. The dust storm felt like an anomaly, like the worst vision ever; and this was all before the bushfires started. Another watershed.

Setting up the *Community Weathering Station* at Bingara the next day was a key moment too, but for different reasons.

Although new collaborators Kate Smith, Lauren Moss and Imogen Semmler were there helping, I was nervous because the idea seemed incoherent. *CoWS* is a constellation of community organisation and activism. It brings knowledge dissemination and skill-sharing together with rest, relaxation and reflection. It is a shelter shed, a library, a workshop, an info-stall and a safe space to weather climate change together. Since its inauguration at Bingara, *CoWS* has travelled to markets and conferences, instantiating its strange vision for a future where we can weather the extraordinary effects of climate change together and, in that act of collectivity, mitigate its worst effects.



Dr Jennifer Hamilton’s research interests revolve around weather and housework. She is currently a lecturer in English at the University of New England, Armidale. For information on her publications and projects go to www.linktr.ee/jmhamilton

Indigiearth

SHARON WINSOR

Born in Gunnedah, Sharon is a Ngemba Weilwan woman of Western NSW. For the first ten years of her life Sharon lived in Rocky Glen where her greatest pastime was collecting bush fruits and catching yabbies, and collecting cans to cash in for pocket money. In the late 1990s, Sharon established Indigiearth, a multi-award winning 100% Aboriginal owned and operated company based in

Mudgee that showcases native products. In September 2020, Sharon took the exciting step of launching the Indigiearth Warakirri Cafe in Mudgee. More than a business, Indigiearth is Sharon’s connection to culture, identity, language and spirituality that provide healing and strength. Visit www.indigiearth.com.au to learn more.



Sharon Windsor is a Ngemba Weilwan woman of Western NSW passionate about connecting people with Aboriginal culture and heritage through native foods and other native products. An award-winning business woman, she is the founder of Indigiearth, a 100% Aboriginal owned and operated company in Mudgee.



“ABC it takes a bee”

(with ukulele chords)

COMPOSED BY AMELIE VANDERSTOCK
ILLUSTRATED BY ROSALIND AMERY



Amelie Vanderstock is a PhD student researching the ecology of native bees in urban greenspaces. She shares her science through original music and workshops across Australia and Japan.

Amelie staged a native bees workshop at Groundswell and Pulse of the Earth. She performed this song, one of many she has written about bees and ecology for the ukulele.

CHORUS

C C7 F C G C
AB—C it takes a bee to take pollen from A to Z
C C7 F C G C
AB—C it takes a bee to take pollen from A to Z

F C
A is for the **Anther** where the pollen sits
G C
Part of the male stamen with the filament
F C
A **Bee** lands on the flower to collect pollen
G C
And store it in her basket called a **Corbiculae**
F C
She **Dances** between flowers with much **Energy**
G C
And pollen sticks to her fluffy fuzzy body
F C
And with each new **Flower** that she visits
D7 G7
To another female stigma the pollen unsticks!

REPEAT CHORUS

F C
The pollen on the stigma grows down the pollen tube.
G C
fertilises the ovule to become a fruit!
F C
We eat these tasty treats and plant the seeds
D7 G7
and in the soil they **Germinate** to become more big fruit trees!

REPEAT CHORUS

F C
Now, who thinks of **Honey** when we think of bees?
G C
Oozing sticky gold we lick off fingers with glee!
F C
But here’s an **Idea** that might feel wacky
D7 G7
Most of bees don’t make honey!

REPEAT CHORUS

F C
With over 20 000 kinds of native bees
G C
Most of whom are solitary
F C
They live alone with a few babies
G C
Without a queen or workers or a colony!
F C
So if they don’t all make honey then what makes a bee a bee?
G C
They have the important **Job** of pollinating
F C
and feed their young pollen as yummy protein
D7 G7
In Kind and caring parcels that they wake to in spring

REPEAT CHORUS

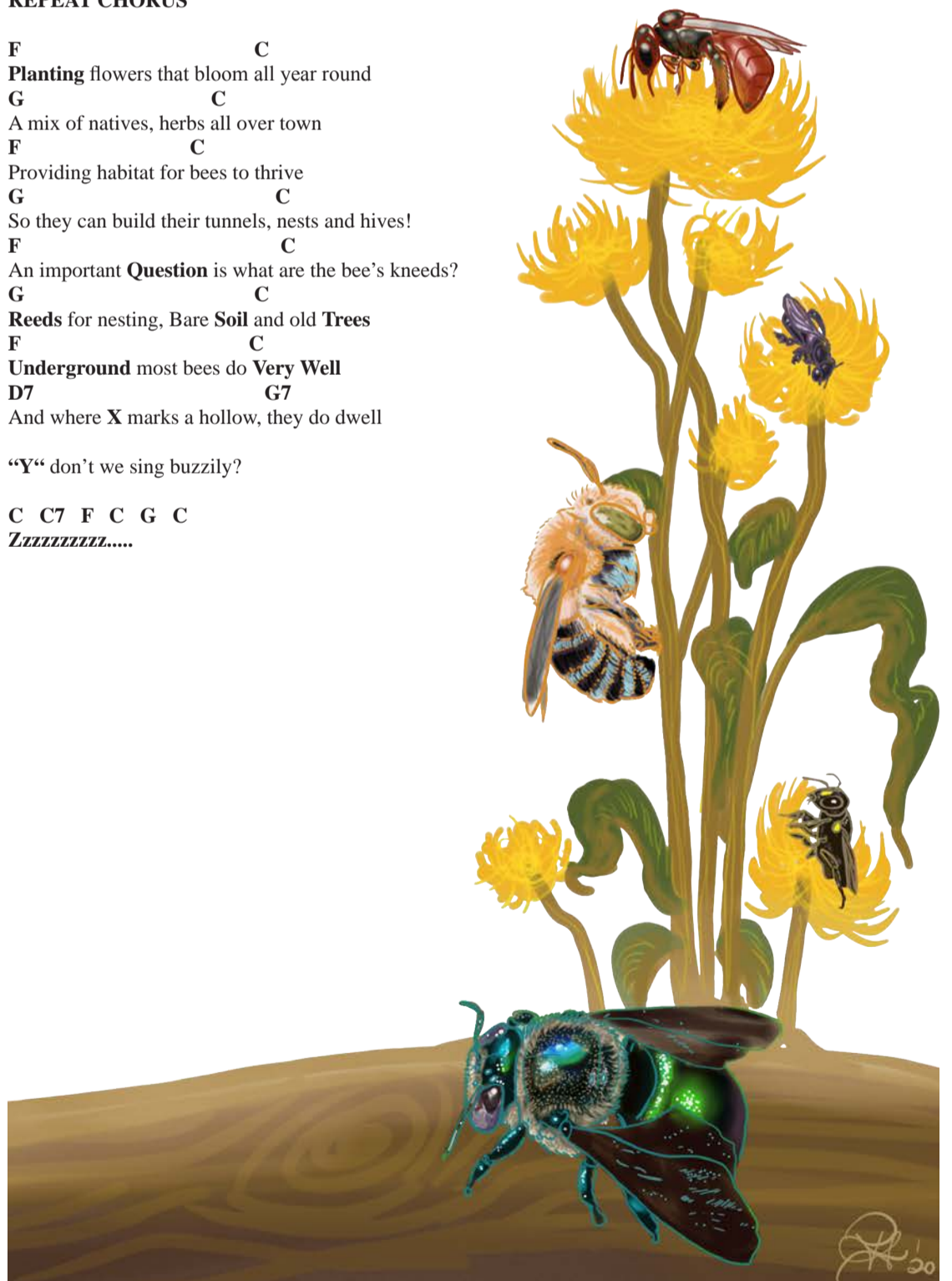
F C
Land-clearing and **Monocultures**
G C
Neonicotinoids and **Other** pest controllers
F C
there are many things that bees find worrying
D7 G7
But together we can we grow the change so bees can keep on Bee-ing!

REPEAT CHORUS

F C
Planting flowers that bloom all year round
G C
A mix of natives, herbs all over town
F C
Providing habitat for bees to thrive
G C
So they can build their tunnels, nests and hives!
F C
An important **Question** is what are the bee’s needs?
G C
Reeds for nesting, **Bare Soil** and old **Trees**
F C
Underground most bees do **Very Well**
D7 G7
And where **X** marks a hollow, they do dwell

“Y“ don’t we sing buzzily?

C C7 F C G C
ZZZZZZZZ.....





SUPERSTICKY EASELPAD
TABLEAU À FEUILLES MOBILES SUPERCOLLANTES
SUPERADHESIVAS BLOC DE HOJAS REPOSICIONABLES



30

25 IN/PO x 30 IN/PO
63,5 cm x 76,2 cm
5,260 FT²/PK² (0,48 m²)

3M

1. For the change
We want....

What do we need
to let go of?

What do we want
to hold on to?

What do we need
to grow in to?

For the change we want

SOUTHERN NEW ENGLAND LANDCARE

The final session of *Groundswell* was led by Sarah Schmude and Jill Moore-Kashima from Southern New England Landcare, with *Groundswell* MC Adam Blakester.

The session gave participants the chance to debrief about their experiences over the weekend, think big picture and cook up future visions.

Inspired by a provocation from Ananth Gopal in the previous session, Sarah, Jill and Adam offered these prompts to the participants:

- What do we need to let go of?
- What do we need to hold on to?
- What do we need to grow into?
- How do we move towards the change that we want?

These photos show participants in the *Groundswell* marquee rapidly prototyping future scenarios together, and debating how best to achieve them. On the opposite page we've laid out a selection of the ideas emerging from the workshop, in response to the four prompts.



WHAT DO WE NEED TO LET GO OF? ANTHROPOCENTRISM **EGO** SOCIAL CONDITIONING **EXPECTATIONS** REDUNDANT PARADIGMS **NEO-LIBERALISM** PRIVILEGE **COMPETITION** MATERIALISM **BEING BUSY** FEAR OF CHANGE **FEAR OF LOSS** WHAT YOU KNOW **FEAR** POWER **INSTANT GRATIFICATION** GROSS CONSUMPTION **THE ECONOMICS OF GREED** POLITICAL ALLEGIANCES **DEPENDENCE ON OUTSOURCING EXPERTISE** MAINSTREAM MEDIA & OWNERSHIP **HUNGER** LIFESTYLE CULTURE **ALL THE THINGS** KNOWLEDGE **OCCUPATIONS** TIME MANAGEMENT **SELFISHNESS** FEELINGS OF WORTH **SELF-AWARENESS** BEING AN INDIVIDUAL **DEBT PRESSURES** OLD PARADIGMS **SUCCESS CRITERIA** WHAT WE'RE SO CONVINCED WE KNOW **EGO** MATERIALISM **SOCIAL EXPECTATIONS** DESIRE TO WIN **OLD IDENTITY** EATING FOOD OUT OF SEASON **SUSPICION OF OTHER PEOPLE'S MOTIVES** RIGID IDENTITIES **MISINFORMATION** PRIDE **THE USUAL WAY OF DOING THINGS** WE'RE THE BOSS **HUMAN CENTRED ATTITUDES** PESTICIDES & CHEMICALS **ECONOMY AS GOD** CONTROL OF BORDERS **HIERARCHY** TRADITIONAL AGRONOMISTS **"SPRAY THAT OUT"** GRIEF **INERTIA** **COMPETITION METRICS** BURDEN OF PROOF **BOUNDARIES** CAPITALISM **CONSUMPTION** THE DOMINANCE OF ONE PARADIGM **PRIDE** REWARDING THE FEW **"THEY"** BUT DON'T THROW THE BABY OUT WITH THE BATHWATER **RUSHING** GDP **WHAT DO WE NEED TO HOLD ONTO TO?** CREATIVITY **ART** IMAGINATION **INITIATIVE** PLAYING **ACTIVE EDUCATION** FLEXIBLE EDUCATION **PLEASURABLE EDUCATION** DIVERSITY **FOLLOWING PASSIONS** WHAT WE ARE GOOD AT **PERSONAL TIME** TO BE STILL AND THINK **AGENCY FOR CHANGE** THE ABILITY TO ACT **PRACTICAL GROUNDED EXPERIENCE** COMMUNITY **EACH OTHER** FUNCTIONING ECOSYSTEMS **HOPEFULNESS** PATIENCE **RESILIENCE** TEACHING OUR KIDS **COLLABORATION** HEALTH **NETWORKS** POSITIVE TECHNOLOGY **EXPERIMENTATION** CURIOSITY **CONSIDERED CHANGE** KNOWING OURSELVES **SENSE OF HUMOR** OUR STORIES **FAITH IN EACH OTHER** TRUST **INTERDISCIPLINARY APPROACHES** **RESPECT FOR EACH OTHER** DIVERSITY OF PEOPLE PLANTS AND ANIMALS **SEEDS** READINESS TO LEARN AND CHANGE **DISCERNMENT** SAFE SPACES FOR CONVERSATION IN ORDER TO CHALLENGE IDEAS **ORGANIC GROWTH** MISSIONARY ZEAL **COOPERATION** DIVERSITY OF APPROACHES **OPENNESS TO NEW IDEAS** POSITIVE ASPECTS OF COMPETITION **LISTENING** PERSONAL RESPONSIBILITY **HONESTY** INTEGRITY **SINCERITY** PATIENCE **OBSERVATION** NON-PRESCRIPTIVE ATTITUDES **INCLUSION** AUTONOMY **BALANCE BETWEEN THE QUANTITATIVE AND QUALITATIVE** AWARENESS OF LANGUAGE **WOLFGANG STREECK** COMMUNITIES **EMPATHY** SLOWNESS **GROWING THE VALUE OF TREES** **WHAT DO WE NEED TO GROW INTO?** DELIGHT IN WHAT WE DO **MODESTY** LIKE-MINDED PEOPLE **INSPIRING OTHERS TO MAKE CHANGE** ADAPTING TO NATURE **WIDER FAMILIES** EMPOWERMENT **EDUCATION** PRACTICALITY **TEACHING COMMUNITIES OF PRACTICE** **MENTORING FOR REGENERATIVE AGRICULTURE** ECOSYSTEM STEWARDSHIP **DADIRRI** **DEEP LISTENING** **ECO-LITERACY** OUR NEW IDENTITY AS CUSTODIANS **EMBODIED LEARNING** CULTURAL PRACTICES **RITUALS** SLOWING DOWN **MORE HEART LESS HEAD** PLAYFULNESS WITH OUR IDENTITIES **LESS SERIOUSNESS** NORMALIZING REGEN AG **CLIMATE CHANGE** SENSE OF COMMUNITY **NEW PARADIGMS** ENGAGEMENT WITH THE WHOLE **OTHER SPECIES TOO** PRIORITIES **OURSELVES** BEING SMARTER **COLLABORATIVE INFORMATION SYSTEMS** BEING BETTER PEOPLE **DOING MORE GOOD** MORE OF WHAT WE ARE DOING TODAY **SUPPORTIVE PEOPLE** HUMAN FOREST NETWORKS APPRECIATION **WHAT WE HAVE** WHERE WE LIVE **WHO WE LIVE WITH** BEING FLUID **EQUITY IN RELATIONSHIPS** COLLABORATIONS BETWEEN DISCIPLINES **HAPPY PROGRESSIVE COMMUNITIES** OPENNESS TO DIVERSE RELATIONSHIPS **HEALTHY CONFLICT OVER OPINION** **ECO-LITERACY** **HOLISTIC MANAGEMENT** QUALITY OF LIFE **PROFITABILITY** SPENDING MONEY ON THE RIGHT THINGS **SUSTAINABLE KNOWLEDGE** ABILITY TO RESPOND RESPONSIBILITY **WORKING TOGETHER** SITTING WITH OTHERS OF DIFFERENT VIEWS **INTERDISCIPLINARY THINKING** CONSCIOUS CHOICES **INTERPRETIVE DANCE** NATURAL CAPITALISM **CONNECTION BETWEEN ARTISTS AND FARMERS** OPENING MINDS **DEEP KNOWLEDGE** TOLERANCE OF VIEWS I DON'T AGREE WITH **FINDING CULTURAL MEMES** CLEAR HOLISTIC GOALS **OBSERVATIONAL EVIDENCE** OUR CAPACITY TO GRIEVE **ACKNOWLEDGING LOSS** INCLUSIVITY **IMPROVISATION** PLAY **LIVING IN IT** TIME AND MONEY **NON-MONETARY SHARING** CRITICAL MASS THINKING **YOUTH FOOD MOVEMENTS** GIVING YOUTH A PLATFORM & VOICE **GROWING YOURSELF UP** BETTER CHOICES **SUPPORT GROUPS** FAILURE **REVERENCE FOR LIFE** SHARING RESOURCES **HOW DO WE MOVE TOWARD THE CHANGE WE WANT?** MOVING TOWARDS **ECO-LITERACY** **RESPECTING BIODIVERSITY** LEARNING NVC **EMBRACING COMPLEXITY** TRUSTING **MYSTERY** THINKING HOLISTICALLY **RE-INTRODUCING KIDS TO THE NATURAL WORLD** LEARNING EXPERIENTIALLY **CREATING A NEW DANCE** LETTING THE LANDSCAPE DANCE WITH US **ACKNOWLEDGING THE CLIMATE EMERGENCY** RESPONDING WITH URGENCY **CREATING COMMUNITY NETWORKS** ENHANCING CONNECTIVITY **FOSTERING ALLIANCES** LIKE **LOCK THE GATE** CREATING **INCUBATING OPPORTUNITIES** MARRYING INDIVIDUAL AND SOCIAL RESPONSIBILITY **WALKING THE WALK** BEING THE CHANGE WE WANT TO SEE **FORMING NEW LINKS** REDISCOVERING THE CAPACITY FOR CHANGE **PLAYING WITH ART** DOING THINGS OUR WAY **SUCCESSFULLY FAILING** FINDING COMMONALITY **CONFLICTING AND RESOLVING** LETTING GO OF PREJUDICE **LEARNING HOW TO MANAGE CONVERSATIONS** TAKING BITE SIZE CHUNKS OF PROBLEMS **NOT 'WINNING' CONVERSATIONS** ALLOWING TIME **LEADING** CATALYSING **BUILDING NETWORKS** BRINGING PEOPLE TOGETHER **RESOURCING** MAKING TIME **ORGANISING FINANCES** OBTAINING FUNDING FROM DIVERSE SOURCES **WRITING APPLICATIONS** PEER TO PEER FINANCING **BYPASSING BANKS** REGENERATING AGRICULTURE **ACCESSING SUPERANNUATION** INVESTING INTO LOCAL COMMUNITIES **COLLABORATING INTERGENERATIONALLY** GOING BEYOND THIS **FOCUSING ON THE CHILDREN AND GRANDCHILDREN** CREATING AND FINDING COMMUNITY **ASSISTING PEOPLE WHEN THEIR IDENTITY IS SHATTERED** TAKING RESPONSIBILITY **CHANGING THE WAY WE THINK** MOVING FROM NEGATIVE TO POSITIVE **MAKING PHYSICAL & EMOTIONAL RITUALS** MAINTAINING HEALTH **CHANGING BY EXAMPLE** ACCEPTING THAT CHANGE IS NOT LINEAR **BEING PATIENT** PRACTICING DEEP LISTENING **ACCEPTING INCREMENTAL CHANGE** DISCOVERING THE MULTIPLIER EFFECT **EMBRACING EVERYONE'S SKILLS** STARTING WHERE YOU ARE **USING WHAT YOU CAN** DOING WHAT YOU KNOW **FEELING IT** LEARNING **SPREADING THE WORD** WORKING THE BELL CURVE **PARTICIPATING** CONNECTING HEAD WITH HEART **JOINING PEOPLE WITH EACH OTHER** TAKING BABY STEPS **MAKING GIANT STRIDES** UNDERSTANDING HUMAN NATURE **TRYING A GUILT-FREE EXISTENCE** SPEAKING UP **BEING BRAVE** MAKING A START **USING ANCIENT KNOWLEDGE** KNOWING WHERE WE WANT TO GO **FOLLOWING AMANDA CAHILL'S 15% RULE** GETTING COUNCILS TO DECLARE A CLIMATE EMERGENCY **INCORPORATING WHAT WE'VE LEARNED AT GROUNDSWELL** BRINGING DOWN OUR ATMOSPHERIC CARBON EMISSION LEVELS **SWITCHING TO REGENERATIVE FARMING PRACTICES** SUPPORTING ORGANIC FOODS **INVESTING IN WHAT WE BELIEVE IN** BEING PRO-ACTIVE **APPRECIATING EMERGENCE** BELIEVING IN THE BOTTOM-UP **RESPECTING IMPERMANENCE** ACCEPTING DETACHMENT **PRACTICING DISCERNMENT** TREATING POLITICIANS AS HUMAN BEINGS **EMAILING** ATTENDING **ENGAGING IN CIVIC SOCIETY** WORKING WITHIN THE SYSTEM **PLAYING THEIR GAME** REWARDING THE SYSTEM **THANKING THEM** CONTRIBUTING TO WHAT IS HAPPENING ALREADY **NOT WASTING ENERGY** SUPPORTING EMOTIONALLY **GROUNDSWELL FEEDBACK SESSION NOTES** COLLATED BY SARA SCHMUDE **8/9/19**

Land Studio

LAURA FISHER



LEFT: The “brush” weir at Umbiella, 2020. RIGHT: Peter Swain during his Welcome to Country at Snowgoose Farm. Photo: Bodhi Todd.



This article tells the story of our first experimental *Land Studio* camp held in the Capertee Valley in September 2020. The concept grew out of the *Artist Farmer Scientist* project. During our collaborations we’d been exposed to a lot of degraded farmland, and learnt that putting regenerative principles into practice was quite a juggle for farmers in the first few years. We often mused about how the wider community might support those farmers. As with the barn-raising and harvest traditions of the past, maybe there was a way to make labour-intensive tasks fun, social and culturally meaningful, and possibly even an educational opportunity for those who wanted to connect with the land.

Even before the *Artist Farmer Scientist* project began, I’d been dwelling on the problem of farms in transition. In 2017 I attended a farmer-focused conference about soil carbon called *Diamond in the Rough* at The Living Classroom. The opening speech was given by the indomitable Major Michael Jeffery, former Governor General, and tireless advocate for soil health. Jeffery began by noting that around 130,000 farmers managed 60% of Australia’s land mass.

Sitting there in a room full of farmers, I was struck by how outrageous this fact was. What does it mean for our hopes of healing the land if such a tiny fraction of our population of 23 million people (roughly 0.06%) manage around 348 million hectares of the country? I already knew Australia was one of the most urbanised societies in the world, up there with Japan and Brazil. 90% of us live in cities or large towns, and the rural population dwindles further every year. We all know that the rural/urban divide creates unequal access to infrastructure, services, education and employment. But Jeffrey’s point led me to think more deeply about the cultural effects of this lopsided population spread, and how little dialogue seems to go on between

the city and the country. Each time KSCA makes new, remarkable friends in rural Australia—innovators and champions for change—I’m frustrated by how much their influence is limited due to city-dwellers’ negative impressions about the country.

As with the barn-raising and harvest traditions of the past, we sought a way to make labour-intensive tasks fun, social and culturally meaningful

All of this suggests that a lot of magic might happen if imaginative, courageous people from both sides of the city/country divide get to mingle more and work together to solve environmental problems. The potential to test these ideas arose after Kerrie Cooke, President of Capertee Valley Landcare and a good friend of KSCA, came along to *Groundswell*. She recognised that artists might be able to support her community’s efforts to restore the waterways of their catchment. In 2019, working with Leanne Thompson, Georgie Pollard and Alex Wisser from KSCA, she instigated the *Capertee Valley Hydrology Project* (which you can read about at www.kzca.land/capertee-valley-hydrology-project). She also connected with The Mulloon Institute, an organisation in Bungendore that has put Natural Sequence Farming into action in synergy with other regenerative methods. For ten years the Institute has stewarded a highly successful landscape rehydration project involving around 20 landowners who share waterways in the Mulloon Catchment. This project is now internationally recognised as a template other communities might follow. Alongside her interest in the Mulloon approach, Kerrie had long wished to host university students in the Valley to take part in land restoration. She and I began to talk about how we could make this happen.

In late 2019 a new community grant from the NSW government supporting climate change resilience popped up. We submitted a proposal to pilot *Land Studio* with farmers in the Valley and students studying KSCA member Lucas Ihlein’s

Creative Arts course “Art, Nature and the Environment” at the University of Wollongong. We were awarded the grant in early 2020... by which time COVID-19 was upon us. A question mark hung over the project for many months. We cheerily navigated the low ‘risk appetite’ of the university knowing our chances of staging the camp were very slim. But we must have charmed a few of the administrators because with the number of community-transmitted cases in NSW reassuringly low in the Spring, we were finally given the green light.

The Valley looked spectacular following the recent rains, the sun shone, and Lucas and I welcomed 23 students to Snowgoose Farm to set up camp. Snowgoose is the property of Emily and Stuart Dawson. They run sheep for wool, raise and sell grass-fed lamb and have embraced regenerative methods like multi-species cropping. Dabee artist Peter Swain welcomed us to Wiradjuri Country at sunset with a smoking ceremony at Snowgoose, anchoring us to the values of stewardship, connectedness and healing.

The following day we made our first visit to Umbiella, a grand historic property owned by Terrie Wallace and Stuart Knox in the centre of the Valley. Terrie and Stuart have been regenerating Umbiella from a degraded state in recent years. They run

grass-fed sheep and cattle holistically to rest the land, sow multi-species crops and avoid chemicals. They are trialing some Natural Sequence Farming strategies as well.

With guidance from Peter Hazel and Bill McAlister from The Mulloon Institute, the students tackled the problem of “slowing the flow”. Pointing out features of the Valley landscape around us, Pete and Bill explained how challenging it can be to harness rainfall, the most erosive force on the planet, to drive regeneration. The students heard how this environment would once have contained wetlands connected to spongy floodplains, with plants cycling nutrients, moderating temperatures and maintaining local rainfall patterns. Now, as in so many parts of Australia, there are deforested paddocks bounded by incised creeks and eroded gullies which funnel water downhill fast. What we now know is that strategic interventions can quell that water’s gravity-powered energy, and encourage the rehydration and ecological recovery of the whole landscape.

To illustrate one such strategy, the *Land Studio* students built a 30 metre wide “pin” or “brush” weir at a deeply eroded creek on Umbiella. We used stakes and plant materials (the “brush”) that we scythed from neighbouring vegetation. Locals Dom, Tony, Chris and Gianluca taught us how to use old-fashioned scythes, and it turned out to be an addictive activity for some of us! We also made small rock weirs further up the creek, moving stones to encourage the formation of pools and to direct water away from the edges of the creek where the banks are eroding.

Elsewhere at Umbiella the students explored the movement of water in a more artistic way by contributing to Leanne Thompson’s *Capertee Water Weaving* project. Leanne had been developing this work for months with community members, to highlight how plants hold water in the land, and illustrate the contour as a tool

for reading the landscape and slowing the flow. The students assisted Leanne to bind a thick, twined rope out of harvested phragmites (reeds) 130 metres long. Hung from bamboo stakes, it formed a striking contour line visible from the road. A couple of weeks after the camp, Leanne and community members, and a few returning students, incorporated woven circles of all sizes created from plants, and large natural sculptural elements into this contour line. It could be interpreted visually in many ways, but I love Terri Wallace’s description of it as an effervescent image of water “bubbling up from the hillside”.

The students also planted 100 trees at Snowgoose Farm, demonstrating another method for slowing the flow. We chose an area where water flows periodically, and which has two dysfunctional dams that the Dawsons would like to re-naturalise. Everyone worked happily into the early evening, admiring the full moon as it rose

over the escarpment. Kerrie selected 100 native species that like to have ‘wet feet’ from the plants she and her partner Dom cultivate from Capertee Valley seeds at their own nursery. These plants will create root systems that draw up nutrients and hold water in the soil.

On the final morning of camp we learnt how to propagate native seed, and gave the Snowgoose Farm orchard some microbial love with a soil bacteria tea Kerrie had cooked up using goat’s whey (left over from the cheese she makes every morning, from the milk from her neighbour Tony’s goats!). After a lunchtime visit to the WayOut art gallery in Kandos, we said goodbye to some very happy, tired but energised students.

There is a very compelling principle that underpins Aboriginal Ranger programs in Australia: “Country needs People”. The respectful interlinking of Aboriginal and non-Aboriginal stewardship in Australia

is still a work in progress, but however that plays out, I think this principle should speak to all of us. How can such an urbanised society take care of its less populated landscapes—not just national parks, but private land? What might change in the public imagination if more of us city-dwellers lingered in the environments that nourish us and took part in regeneration? And what ideas might spring from the minds of students who experience that work as part of their university degree? This first camp was an opportunity to pose all of these questions. We look forward to developing the *Land Studio* model further, exploring how land stewardship, food production and climate change adaptation can all be part of the same project, with compassionate relationships between people at its heart.

This project was funded by the NSW Government Department of Planning, Industry and Environment through its Increasing Resilience to Climate Change Scheme. With thanks to Capertee Valley Landcare, The Mulloon Institute, Snowgoose Farm, From the Paddock and Cementa.



Dr Laura Fisher is an artist and social scientist. Her projects build fruitful connections between the city and the country to support land regeneration, better food systems and community wellbeing. Laura is a founding member of Kandos School of Cultural Adaptation (KSCA) and a social researcher with The Mulloon Institute.



TOP: Leanne Thompson (spotted shirt) and students with the 130 metre rope of harvested phragmites that became part of the *Capertee Water Weaving* land art sculpture, 2020.
 BOTTOM LEFT: University of Wollongong students Angelic McNab and Sarah Arnesen rise and shine at *Land Studio* camp. Photo: Lucas Ihlein.
 BOTTOM RIGHT: Pete Hazel from The Mulloon Institute stands before an eroded creek wall at Umbrella Farm, explaining to students what can be learnt from the soil profile.

Tuning into your inner conservative

ANANTH GOPAL

Ananth Gopal relishes his role as a cultural provocateur. At Groundswell, Ananth asked a set of questions which rapidly evolved into prompts for a giant group discussion (see pages 49–51). Upon his return to his home in Warragul, Victoria, Ananth penned this probing thought experiment.

It feels like a decade since the summer of 2019, the black summer that razed regions and blanketed our collective consciousness. We in Australia breathed in ancient forests that were incinerated by our inability to properly steward these lands and our unwillingness to take responsibility for our part in destabilising our climate. Instinctively, I blamed people and voters who do not agree with my environmental politics. I blamed political conservatives. But living in regional Victoria and speaking with my fellow Gippslanders, who are (anecdotally speaking) temperamentally conservative, has jolted my moral certainty. I'm reconsidering some of my aversions to some forms of conservatism and seeing the value of patriotism when deployed at the service of ecological regeneration.

Temperamental conservatives are loss averse and have a drive to conserve and preserve. This type of conservatism shows up in an individual's psychology rather than voting patterns. It stands at a distance from the conservatism often found in centre-right or far right parties. In this essay I want to explore how tuning into our inner (temperamental) conservative might support cultures of land stewardship.

The irony of posing this question on a continent that has been continuously cared for by Aboriginal Australians is stark. The first response to this question seems obvious and transformational but faltering: taking Indigenous cultures of land stewardship seriously. Dismissing Indigenous self-determination is not only immoral but also ecologically stupid—the *Uluru Statement from the Heart* needs to be enacted. Thankfully there are a number of promising glimmers across the country where Indigenous knowledge is helping heal Country. These include legal challenges to mining giants; a reappreciation of Aboriginal women's burning practices and a careful revision of imperialist understandings of First Australians as solely hunter-gatherers. Restoring, reviving and repurposing sophisticated First Nations' ecological knowledge is paramount. Newer cultures of land stewardship will also need to be part of the mix—ones that are tuned to our many novel ecologies.

I reckon we'll need a culture of land stewardship that is inclusive of a diversity of temperaments and moral reasoning. The multiple ecological challenges this nation and the planet faces may not be able to be solved by a homogenous set of temperaments and ideologies. They certainly won't be solved by policy makers or desk bound academics alone. They might not even be solved with exclusively "like minded" people. Land stewardship initiatives might need to combine National Party voting farmers, inner-city Greens

voters, left-leaning tree changers, union members and even One Nation supporters confused about the main threats to "our way of life". Topsoil erosion, dryland salinity and ravenous bush fires will need a mixture of minds that include so-called "progressive" and "conservative" constituents to come together and work together. The *Land Studio* pilot (see page 52) might be one such project that combines "unlike minds" and this, hopefully, could produce a hybrid set of ethics and actions.

According to the KSCA website, *Land Studio* "will test a new creative model of land stewardship that responds to the need for urban and rural citizens to collaborate to regenerate degraded agricultural land, build soil carbon and create a more sustainable food system". *Land Studio* aims to bring traditional owners, farmers, undergraduates, tree changers and academics together to learn while working on the land of the Capertee Valley. This seems distinct to the Permaculture courses I've attended or the university subjects I've taught, as it bridges important divides between the academic and the practical, regional and urban, farmers and greenies, and possibly progressive students and more conservative land managers. Having university students use their bodies to work and care for denuded farmland is, to me, a key part of the promise of *Land Studio*.

While young people working on land is no new thing (think Wwoofing, kibbutz or hippie communes), I'd like to ask: what if *Land Studio* framed itself as a patriotic act—a way of defending the sovereignty of this land? The tangible outcomes of rehydrated and recarbonised soils may also produce a greater understanding between typically estranged groups like farmers and young university activists. Let me speculate a bit beyond the scope of *Land Studio* into academia and civic life in general with a few more "what ifs":

The multiple ecological challenges this nation faces will not be solved by a homogenous set of temperaments and ideologies

- What if universities gave students a positive and constructive experience of nationalism?
- What if higher education courses helped cultivate a stronger sense of collective identity spanning urban/country, producer/consumer and left/right divides?
- What if custodianship was a way of regenerating the sanctity of place?
- What if patriotism was enlisted in regenerating our biosphere?

If my choice of words "patriotism", "nationalism", "nation" and "sanctity" makes you squeamish—I get it. They put me on high alert too. They seem coated in history and politics that I have long rejected. Yet, maybe the moral terrain those describe can be reclaimed and repurposed? The virtues of loyalty, purity and respect for authority seem to animate those on the political right, often termed "conservative", while those of us (like me) on the political left seem focussed solely on preventing harm and ensuring fairness. Environmental justice and land care trigger a predictable energy in progressives like me but maybe the collective challenges of climate change and topsoil conservation/regeneration require more than two temperamentally and ethically conservative impulses.

Jonathan Haidt's work on social psychology anchors my thinking here. In his book *The Righteous Mind*, Haidt outlines how all human societies across the world compose their moral codes around six moral foundations based on tensions:

1. Care/Harm
2. Fairness/Injustice
3. Loyalty/Betrayal
4. Authority/Subversion
5. Sanctity/Degradation
6. Liberty/Oppression

Haidt and his colleagues conducted fieldwork in India, Brazil and the United States to arrive at these six moral foundations. They cut across a spectrum of cultural and economic contexts. Curiously, their work also revealed that in affluent Western nations like the U.S and Australia the six-part moral matrix is mostly practised by those who identify as conservative or right-leaning. People like me, who occupy a progressive space, tend to be fluent in foundations one, two and six but silent on three and four. Our moral ear is only

has been instructive. I've learned that temperamentally conservative people are often put off by environmentalism that focus solely on justice and care without engaging a deeper love and loyalty for the country.

What would happen if more of us tuned into and embraced our inner conservative and framed environmental challenges in terms that invoked loyalty to nation or, as a way of protecting the sanctity of our home? Some might worry that this would make us fascist enablers or create gateways to the alt right. I too harbour that concern. Bad faith actors are already using "environmental" concerns as cover for nastier agendas. Pauline Hanson has invoked protecting Australia's environment from "migrant hordes"—while others (not bad faith by my read) like Dick Smith have drawn causal links between environmental degradation and immigration.¹ They are silent on cultures of land stewardship and hardly ever champion movements like regenerative farming, and yet they claim the moral high ground that progressives like me have long ceded. New cultures of land stewardship will need to be composed across all six moral impulses. A *Land Studio* that is tuned to the inner conservatives among our communities might succeed in winning back that moral ground.

Giant bushfires, choked waterways, loss of topsoil, loss of flora and fauna are civilisation-level existential threats. They are, or should be, a temperamental conservative's worst nightmare. But maybe the environmental movement hasn't sung their melody yet? Farmers and Indigenous land managers could help tune the next generation to a moral repertoire played with six (or more) notes. The *Land Studio* project holds the potential to bridge not only geographic divides but temperamental, aesthetic, and cultural ones too. Farms, rivers and the bush are sacred sites that deserve the loyalty of an inclusive nationalism. Conservatism, in a temperamental sense, is founded on a love and loyalty of holding onto what's precious. Respecting and learning how a diversity of Australians compose their moral melodies can be an act of inclusive citizenship.

1. , T. (2019). 'Green Anti-Immigration Arguments Are A Cover For Right Wing Populism'. *Green Agenda*, accessed 10 February 2021, at www.greenagenda.org.au/2019/02/right-wing-populism-cover.



“The Art and Science of Adaptation” session at *Groundswell*, 2019. From left: Ananth Gopal, Rachel Lawrence, Ian Milliss and Charles Massy.

polykala

Polykala designs and delivers experiential learning programs focusing on Leadership Development, Group Facilitation and Effective Communication. Our facilitators use experiential and improvisational learning methods to generate insights, make connections and catalyse actions. Our work draws on systems thinking, positive psychology and artistic practices that combine mind and body. Polykala works with a range of organisations including Oxfam Australia, City of Melbourne, University of Newcastle and the Australia Council for the Arts in their efforts to promote social and environmental adaptation.

Visit our website: polykala.com



Dr Ananth Gopal is a facilitator, geographer and actor. He's an associate artist with Melbourne Playback Theatre Company and holds a PhD from University of Wollongong specialising in socio-ecological adaptation. Ananth is the co-director of Polykala, which provides experiential training and facilitation in adaptive leadership to a range of organisations.

Serres' Ark: crossing disciplines at Groundswell

VICKIE ZHANG

Cross-disciplinary collaboration is at the heart of what we do at KSCA. In this essay, Vickie Zhang draws on the work of boundary-blurring philosopher Michel Serres, showing why it's so important to trespass beyond our professional borders if we want to tackle the big questions of our time.

"Between the hard sciences and the so-called human sciences the passage resembles a jagged shore, sprinkled with ice, and variable. ... It's more fractal than truly simple. Less a juncture under control than an adventure to be had. This is an area strangely void of explorers."
—Michel Serres¹

French philosopher Michel Serres was many things. He was a mountaineer, a rugby lover, a great-grandfather. The son of a bargeman on the Garonne River, his early adult life was spent as a sailor in the Naval Academy. Resigning from the navy, he then trained as a mathematician and physicist. But he soon turned to literary studies and the history of science, becoming a renowned professor of philosophy. He taught for almost three decades at the Sorbonne in Paris before being appointed at Stanford University in 1984. He stayed there until 2019, upon his death at the age of 88.

Serres was one of France's best-known public intellectuals. He was a philosopher of the people, a discipline-crossing humanist, a classical thinker in modern times. Late in his life, he had a regular radio spot with an audience of millions and would be recognised on the street. His expansive thought synthesised the many strands of his education—the toil of navy life, the elegance of mathematical thought, the revelations of sustained contemplation.

Although moving to the humanities, he never left maths or science behind. Instead, his philosophy has been dedicated to traversing the disciplines. His approach, as one commentator puts it, is to "read

culture 'scientifically' and read science 'culturally'.² Serres' style, moving itinerantly from science to myth, from fable to philosophy, flows from "his belief that to operate within one field of knowledge alone is to remain landlocked."³ Across a lifetime of writing, Serres consistently highlights the poverty of any single discipline's approach when compared to the teeming and complex landscapes of the world—places which hold so much more than any body of knowledge can ever hope to contain.

While the sciences and the humanities have attempted to offer their own explanations for the world, they have turned their backs on one another, drifting further apart

Serres' early and defining work in the 70s and 80s tracked the parallel development of scientific, literary and philosophical knowledge trends. It is erroneous, Serres suggests, to believe that disciplines piece together, puzzle-like, to form a seamless image of the world. From his earliest works, Serres dispels the myth of this smooth surface. Knowledge is not a relay race, with one discipline taking up where the other ends. Instead, Serres puts forth a fractured, serpentine and tempestuous imagination of the world.

Serres evokes the figure of the Northwest Passage to describe the labyrinthine path from the humanities to the sciences. Fittingly for a former sailor, the Northwest Passage refers to

the sea route connecting the Atlantic and the Pacific, linking Europe to Asia. It is a treacherous journey through the hazardous terrain of the Canadian Arctic Archipelago, pockmarked by islands, ice floes and the changing shores of seasonal pack ice. The complex maze of the Northwest Passage is full of obstacles, dead ends and blocked paths; the route twists and turns, connects and divides. In Serres' hands, the Northwest Passage becomes a metaphor for the vexed, unique and difficult space between the sciences and the humanities.

The Northwest Passage, then, refers to the circuitous processes of interchanging, translating and explicating that are involved in voyaging from one discipline to another. The assumption has always been that such connections would be straightforward, simple, easy to build. As if the disciplines move together in lockstep, responsive to each other's interests and trends. Serres rejects this notion; instead, he argues that while the sciences and the humanities have been attempting to offer their own explanations for understanding the world, they have each turned their backs on one another, digging into their burrows, drifting further apart.

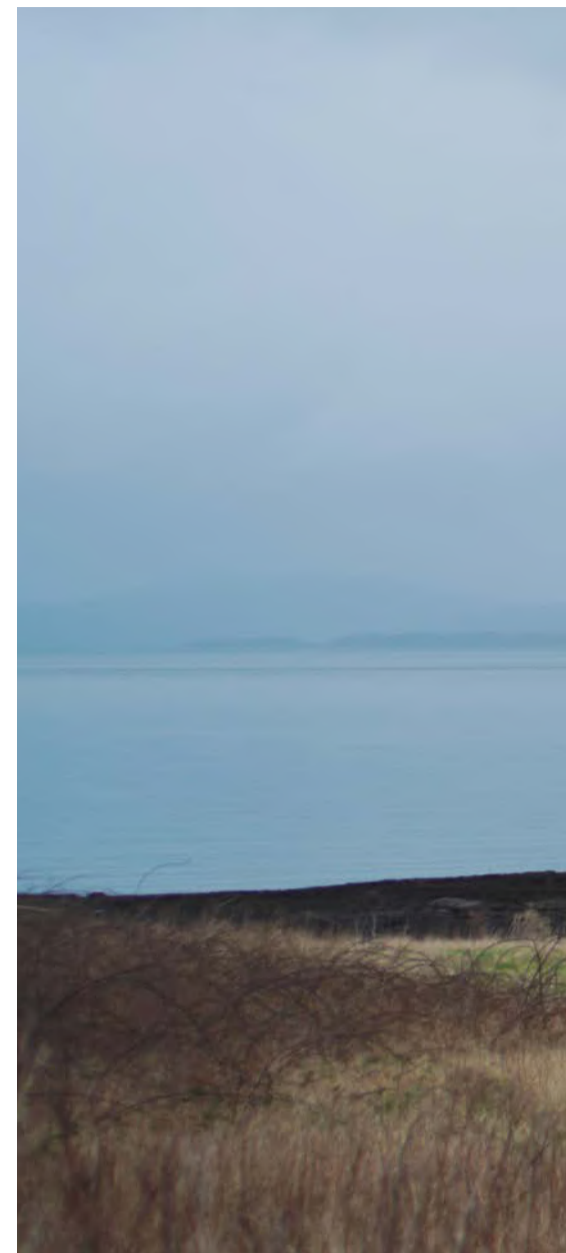
The uncharted waters between disciplines are thus of much greater interest

to Serres than disciplined knowledge, not just because they are unmapped, but because no map *can* exist for them. The spaces in-between are always spaces of chaos and turbulence, places of movement and exchange. Serres describes such a journey as a *randonnée*—what might be translated into English as *rambling*, in the sense of a walk or excursion through space. It is a journey during which one is exposed to the *random* discoveries of space and time, to impetuosity and chance. An anthropologist's hat is required for wayfaring of this kind; only local observations and regional truths can lay the groundwork for footpaths through the dense, overgrown scrub that covers the earth.

In conversations with science studies professor and fellow Frenchman Bruno Latour, Serres gives rare insight into the origins for his itinerant trajectory. Born in 1930, Serres came of age in a different time of global crisis, part of a generation formed by the dropping of the atomic bomb over Hiroshima that ended World War II.

The atomic bomb was the seismic event that defined Serres' thought, influencing his views on science forever. As a scientist, he was unable to reconcile his relationship to a field able to provide the raw materials for such a catastrophic event. But turning to philosophy ultimately yielded no refuge either; there, Serres was aghast to find a discipline untouched by and indifferent to atrocities that had reshaped the world, still interested in the same old abstract questions.

Such are the motivations for his discipline-crossing approach, Serres explains. "When you have no affiliations





Voyaging across jagged shores. Photo: Vickie Zhang

and want above all to avoid them, when you have no home and cannot live anywhere, you are very much obliged to begin a project.” Solitary intellectual life is like that of a wanderer on the high seas: “when you are lost and it is stormy, you quickly feel the need to build a raft or a boat or an ark—even an island—solid and consistent, and to supply it with tools, with objects, with shelters, and to people it with characters.”⁴

A ship is a moving village; once built, it is available to provide for others. With his philosophy, Serres builds an ark. He draws on agriculture, art, baking, classical poetry, ecology, fluid mechanics, literature, mathematics, meteorology, mythology, nursery rhymes, sailing, space travel. He writes of angels as the messengers of information theory, parasites as the origins of human relations, turbulence as the foundation of civilisation. For Serres, scientific invention is not ultimately aimed at a ‘better’ systemisation of knowledge. Nor is he advocating a simple importation and exportation service between the arts and sciences. The objective of Serres’ Northwest Passage between disciplines is *invention* itself, recognising that it is only by detouring through the confluences of projects, practices and ideas in the world that new ideas have a chance of springing forth. He maps out possible routes between distant specialities, giving blossoming seafarers the tools to make their own rambling journeys. Serres’ ark is his gift to wandering souls, discontent with the gap between states of existing knowledge and the changing way of the world around them. After all, as Serres underscores, knowledge does not exist for its own sake, but rather as part of the ‘natural contract’

that binds us to each other, and to the earth.

* * *

*‘The ship is safer in the harbour,
but it is not meant for that.’*
—Anonymous fortune cookie

Born into a different age of environmental destruction, another generation finds itself at a crossroads. Confronted with the magnitude of the epochal challenges confronting society, the straight-line superhighways offered by tradition look increasingly untethered from a world in flux.

Optimised routes blind the senses to fluctuations and disturbances. Roaring along the disciplined superhighways of knowledge, the fastest routes avoid hesitation, suspend doubt, evict uncertainty. The happy traveller hears only the din of their own purring engine, drowning out the sounds from the surrounding landscape. But Serres helps us to recognise that the cries that threaten to draw us off course are not just white noise. They emanate, instead, from the voice box of the world. Howling winds, screaming fires, feverish storms. Parched river-mouths, heaving tides, collapsing ice.

And so, we drive up from Sydney through the dust, taking a trail that leads northwest to Bingara. Tim, Amelie, Lucas and myself in one car; Marnee and Diego just in front. Between us, a pick-and-mix ragbag of computer scientists, interior designers, experimental situationists, weed foragers, university lecturers, apiologists, cultural geographers, science communicators, socially engaged artists, ukulele strummers. It is the first time many of us have met, and we pass the eight or nine hours in transit joyfully, eating and snoozing, discussing and debating,

stopping and starting, gazing out the window.

Together, we slow down and veer off course. We take the off-road trail that diverges from the main path, straying from the highway to envelope ourselves in the cacophonous landscape. Planting oneself in local terrain enables listening; listening, in turn, is the precondition for dialogue and a precursor to response.

* * *

Truth be told, I found myself somewhat accidentally on the *Groundswell* journey. I arrive in Bingara with my new friends, but I can’t help but feel unsure of my presence: a city dweller from a southern state, underqualified and out of place, out of my comfort zone, over a thousand kilometres from home. But *I’m here*, I tell myself. So I try to help out, get my hands dirty, find a way to be useful. Over the next few days, I sit and watch and listen and laugh, my eyes and ears open to the vistas unfurling around me, the voices and ideas filling the air.

Watching the mixed bag become a loose collective, I slowly realise that it is not just me who feels out of place. In fact, we have all stepped a little outside of our own conventions, veered off the map, dipped into uncharted waters. We are all a bit unsure, each in our own way, of just what is happening, precisely how it is we fit, what it is that has drawn us here. We have all taken a left turn to ramble through the bush.

Looking around, I finally grasp that *this* is exactly the point. Like Serres, *Groundswell* is building an ark, one that is fit for the high seas, for the Northwest Passages beckoning us. Creating a village, offering shelter, *Groundswell* issues an

invitation for all of us to traverse the middle spaces where knowledge is afraid to go. To all those attuned to the anguished cries of the landscapes around us, *Groundswell* is an incitement to voyage, to listen, to invent. Although acknowledging the difficulty of navigating new routes across underexplored terrain—there will be dead ends, stumbling blocks and awkward u-turns—*Groundswell* is optimistic. There will also be warm hearths, many laughs and much to learn. We hope that you will set sail on the adventure with us too.

1. Serres, M. and Latour, B. (1995). *Conversations on Science, Culture, and Time*. University of Michigan Press: Ann Arbor, p. 70.
2. Brown, S. D. (2005). ‘The Theatre of Measurement: Michel Serres’. *The Sociological Review*, 53(1), p. 217.
3. Connor, S. (2009) ‘Introduction’. In: Serres, M. *The Five Senses: A Philosophy of Mingled Bodies*. Continuum: New York, p. vii.
4. Serres and Latour. *Conversations*, p. 21.



Dr Vickie Zhang is a cultural geographer interested in economic transitions, embodied transformations and working-class life. She recently completed a PhD on life after coal mine closures, during which she spent several months undertaking fieldwork with current and former mine workers in Kandos, NSW and Pingdingshan, China.



TOP LEFT: "Workshop on our future", *Pulse of the Earth*, with Charles Massy, Laura Fisher, Damon Gameau, Rachel Lawrence & Adam Blakester. TOP RIGHT: Alex Wisser performs *Earth Oracle* in the Kandos Community Hall at the *Cemeta* festival, 2019. Photo: Ian Hobbes. MIDDLE: Walking the freshly-dug Keyline Dam at "KSCA's Art and Farming Picnic with Epicurean Harvest", Bula Mirri farm, 2019. BOTTOM LEFT: Marnee Fox, Diego Bonetto & Karla Dickens at the *Wildfood Store*, *Groundswell*, 2019. Photo: Vickie Zhang. BOTTOM RIGHT: The opening night of *Uncertain Territory*, Artbank, Sydney, featuring KSCA installation, 2019. Photo: Alex Gooding.



TOP: MC Costa Georgiadis and audience at the public event “An artist, a farmer and a scientist walk into a bar”, The Clothing Store, Carriageworks, Sydney (2019). The setting was *Kaldor Public Art Project 34: Absorption* by Asad Raza, which saw the building filled with 300 tonnes of soil. MIDDLE LEFT: *Art, Farming & Cultural Change* exhibition opening, Lyttleton Stores, 2019. MIDDLE: RIGHT: *humus:human* at Siteworks, Bundanon Trust, 2019. Photo: Jonathon Bolitho. BOTTOM LEFT: Imogen Semmler, Erika Watson, Timothy Cavagnaro, Ian Milliss and MC Costa Georgiadis at the Carriageworks event, 2019. Photo: Hayden Druce. BOTTOM MIDDLE: Allan Yeomans with students at *Shapes of Knowledge* exhibition, Monash University Museum of Art, 2019. Photo: Lucas Ihlein. BOTTOM RIGHT: Brendan Blacklock, Lashaya Dixon Toomey, Tamimya Bloomfield, Karla Dickens, Bruce Pascoe and Sharkiah Dixon Toomey, 2019. Photo: Laura Fisher



Diego Bonetto's foraging walk at *Groundswell*, 2019.

AN ARTIST, A FARMER AND A SCIENTIST WALK INTO A BAR

Published by Kandos School of Cultural Adaptation (KSCA) March 2021
 ISBN: 978-0-6480276-2-1
 Printed by Spotpress

Editors: Laura Fisher, Lucas Ihlein and Vickie Zhang

Graphic Design: Sunny Lei and Mickie Quick

Copy editing: Ian Milliss and Sarah Breen Lovett

All photos by Alex Wisser unless otherwise attributed.

An artist, a farmer and a scientist walk into a bar was an initiative of the art collective Kandos School of Cultural Adaptation (KSCA). It was staged in partnership with CEMENTA Inc., The Living Classroom and Starfish Initiatives, and was generously funded by a Regional Partnerships Grant from Create NSW. The project was produced and coordinated by Laura Fisher in collaboration with other members of KSCA.

KSCA is a collective that supports artists and others who are experimenting with adaptive cultural change. KSCA was sparked by a 2013 poster by Ian Milliss, and propelled by the enthusiasm of Gilbert Grace and an ever-growing group of collaborators. The collective aims to foster creative work that reaches beyond the familiar contexts of art to investigate new ways of acting in the world. Its current members are: Diego Bonetto, Laura Fisher, Lucas Ihlein, Eloise Lindeback, Sarah Breen Lovett, Ian Milliss, Georgie Pollard, Manu Prigioni, Imogen Semmler, Leanne Thompson, Kim Williams, Kelly Reiffer, Alex Wisser and Vickie Zhang.

We are most grateful to all our project collaborators, and to the authors who feature in this publication, for their contribution to this project. There are many people who don't appear in the pages of this newspaper, but who generously supported our residencies, workshops and events. Thanks to:

Aidan Archer, Albie Muller, Alex Gooding, Alex Hunter, Alice Wood, Allan Giddy, Antonia Fredman, Artbank,

Asad Rasa, Bec Dean, Belinda Innes, Ben Vincent, The Biochar Journal, Bingara State Emergency Services, Bob Moylan, Bonnie Fisher, Brendan Blacklock, Brett Nutting, Brigitte Podaskry, Brogan Bunt, Brooke Wall, The Bundanon Trust, Capertee Valley Landcare, Carmen Southwell, Carriageworks, Chris Panagiotaros, Chris Yeomans, Christine Sweet, Christine McMillan, Costa Georgiadis, Damon Gameau, David Pointon, Derek Smith, Dom della Libera, Edwina McEgan, Ekala Geesu, Eloise Maree Crossman, Emily Dawson, Emily Sullivan, Ezra Geesu, Fiona Davies, Geoff Bassett, Geoff Leech, Gianluca Della Libera, Gilbert Grace, Halinka Orszulok, Hall Murray, Hannah Mathews, Imogen Dixon-Smith, Isaac Carne, Jamie Roberts, Jane Pickard, Jasmin Ryan, Jennifer More, Jessica Gardner, Joan McLachlan-Connelly, John Baylis, John Bishton, John Kaldor, John Sweet, Julie Gibson, Julie Ryan, Justin Hewiston, Karen Bishton, Katrina Morris, Kelvin Brown, Kirsten Bradley, Kylie Baxter, Lisa Daly, Lizzie Muller, Loma Cuevas-Hewitt, Lyn Cutmore, Lyttleton Stores,

Manu Prigioni, Matt Woodham, Max Eastcott, Max Roberts, Megs Stamer, Mel Ratliff, Nick Fury, Oliver Watts, Peter Turnbull, Rachel Bond, Rawri Simmonds, Ray South, Rhonda Murray, Ryville Ochoa, Sam Bermel, Scott Crispin, Shakaya Geesu, Simon Mattsson, Stuart Dawson, Stuart Dick and the team from the Rural Fire Service, Stuart Knox, Sue Muller, Susan Hutton, Suzanne Riley, Tammy Powell, Tasch Arndt, Terrie Wallace, Tim Wright, Timothy Cavagnaro, Tirrania Suhood, Tom Loeffler, Tony Gomez, Victoria Walker and Warisa Somsuphangsri.

A series of videos and podcasts about the eight projects were created by Justin Hewiston, you can find them here: www.ksca.land.



This newspaper has been printed on paper that has a recycled component and is made to FSC (Forestry Sustainability Certification) standards. Spotpress has ISO certification for its Sustainable Business practices.

