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naturematters

ENGAGING PEOPLE IN CONSERVATION

Credit: Cleland Wildlife Park

Appeals

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Nature FOUNDATION

SUPPORT GROUND-BREAKING RESEARCH TO UNDERSTAND AND HELP CONSERVE AUSTRALIA'S BEST-LOVED SPECIES

Main: Credit: nicolemankowskiphotography.com
Below: Chris Daniels, CEO of the International Koala Centre of Excellence (IKCE). Credit: Cleland Wildlife Park

During the summer bushfires, twenty-eight koalas were rescued from Hanson Bay Wildlife Sanctuary on Kangaroo Island. Prior to January 2020 this area was home to thousands of koalas – currently only 42 animals survive there. It will take the remaining trees at least 3–5 years to recover sufficiently to support the koalas.

As animals free of the two most significant infective diseases – Chlamydia and Koala Retrovirus – that plague Australian mainland koalas, the rescued colony is vital for understanding, managing and treating these diseases and potentially re-wilding healthier, more resilient individuals in the future. The current decline in koala populations throughout Australia can only be reversed if these diseases are managed.

The colony rescued from Kangaroo Island resides at Cleland Wildlife Park SA and is managed by the International Koala Centre of Excellence (IKCE), a foundation that supports research into koala biology and habitat. A disease-free captive population brings together koalas into a secure managed area with the intention to breed them according to best practice recommendations.

The healthy animals will serve as an essential insurance population against further disease outbreaks and in case of the extinction of these koalas in the wild. The plan is to expand the number of KORV/Chlamydia-free koalas for study and possibly translocate healthy and resilient individuals to appropriate facilities around Australia.

Your generous support of the rescued koalas will contribute to the national conservation and management of this beloved species through:

- Establishing and growing the colony from 30 to 50 Koalas over the next two years;
- Breeding an additional 10 joeys by December 2020;
- Introducing a male Strzelecki koala into the breeding program and establishing genetic analysis and monitoring to develop an 'out bred' colony of genetically diverse individuals with a lower likelihood of developing disease;
- Establishing partnerships for research and allies to support additional colonies of these valuable animals around Australia;
- Enabling the colony to be independently supported by IKCE from July 2021.

Please help support this invaluable group of healthy, vibrant and disease-free koalas, which are so important for developing greater understanding of how to conserve the species long-term.

GRAND START GRANTS APPEAL

Hillaba Pretty Point sunrise panorama looking south west. Credit: Bill Doyle

Far left: Sarah Barker holding four juvenile Gidgee Skinks. Credit: Sarah Barker

Left: Baptiste holding a Central bearded dragon (*Pogona vitticeps*) in Sturt National Park. Credit: Dympna Cullen

Let's help more of South Australia's best postgraduate scientists undertake conservation research with Nature Foundation's Grand Start Grants

One of the greatest challenges our generation faces is to conserve the variety of plant and animal life – the biodiversity – that characterises healthy ecosystems. The ability to understand how to conserve them and create a sustainable future for us all depends on excellent scientific research.

Nature Foundation's grant program is funded by donations from our generous supporters – all of you! – and partner organisations such as the Scientific Expedition Foundation. Together we fund research that contributes to the conservation of South Australia's biodiversity.

Since 2003 we have funded 418 grants totalling more than $1.7 million to university students, universities and other research institutions. Nature Foundation is proud to have contributed to the development of so many bright young scientists in the early stages of their careers.

In 2020 we awarded 13 research grants across six categories totalling $64,000 and are happy to introduce those researchers and their wide variety of projects in this edition of Nature Matters.

Nature Foundation grant recipients undertake research into complex challenges that will improve the health of the environment including:

- water – especially relating to Water For Nature activities and the River Murray
- climate change resilience
- managing threatened and over-abundant species
- biodiversity and conservation of South Australian landscapes, marine and freshwater environments
- improving the connection between community and nature.

Our Grand Start Grants program for postgraduate students offers funding of up to $3000 for one year to PhD and Masters students and up to $2000 for Honours students. All projects have appropriate ethics approval. One of our 2019 recipients Isabelle Onley, a PhD candidate at The University of Adelaide, is featured in this publication. Isabelle's research on Greater Stick Nest Rats was a unique opportunity to study the effects of climate change in a native species over several generations using cutting-edge DNA technology. Her results have significant conservation implications for threatened species Australia-wide. All projects have appropriate ethics approval.

This spring we are asking for your help to ensure that critical scientific research such as Isabelle's continues to be possible and the resulting knowledge applied for making the most efficient, effective and valuable contributions to sustaining South Australia's unique biodiversity.

Your support empowers us to fund more research projects that provide tangible solutions to environmental challenges. Please consider making a donation to the Nature Foundation Grant Start scholarship fund today.

Parrot Regent Kararapko.
Credit: Helga Kieskamp

From the Chair
Jan Ferguson OAM

Warm greetings to all members and supporters. I hope you have been enjoying the spring sunshine and a chance to spend time in the many beautiful natural environments our state offers. With the reopening of Witchelina and Hiltaba Nature Reserves to visitors on 1 July, nature-based tourism is in great demand and Hiltaba has been booked out for weeks at a time!

Since our last Nature Matters publication, Nature Foundation and National Parks and Wildlife Service South Australia launched the Wildlife Recovery Grants program. We were delighted to allocate over $450,000 to twenty projects to help re-establish critical habitat and undertake priority recovery actions in South Australia, particularly for threatened and vulnerable species. These bushfire recovery projects were made possible by the immense generosity of our supporters following the summer bushfires and we look forward to sharing the outcomes of this on-ground work with all of you.

Nature Foundation is also thrilled to lead delivery of the Revitalising Private Conservation in South Australia program with partners Conservation SA, Livestock SA, Trees For Life and Nature Conservation Society of South Australia. The program, funded by the South Australian Government and launched by Minister Speirs on 4 August, aims to expand the number, extent and quality of protected areas of native vegetation on private land in South Australia. Existing and aspiring Heritage Agreement owners can now apply for grants large and small to plan and undertake important nature conservation work on their properties. See the article in this edition and visit www.revitalisingconservationsa.org.au to find out more.

Thanks to those who joined us for the Nature Foundation Member Update and Grant Award Ceremony – held via webinar in late July. It was wonderful to see the wide variety of important ecological research projects being undertaken by our awardees and to hear their presentations. Read about our 13 grant recipients and their fascinating projects in this edition.

This spring we are launching two appeals to help fund such essential research for nature conservation:

- Research into and expansion of the International Koala Centre of Excellence triple disease-free post bushfire koala population
- Nature Foundation Grand Start Scholarships Fund, to provide grants for nature conservation-related research including student grants.

Thank you in advance for your generous support of these appeals. With your help we can ensure that critical scientific research is undertaken and the resulting knowledge applied for making the most efficient, effective and valuable contributions to sustaining South Australia's unique biodiversity.

With deep gratitude but also sadness we accepted Susie Herzberg's recent resignation from the Nature Foundation Board. As many of you will know, since 2006 Susie has contributed an incredible amount of effort and support as a Member, Volunteer, Committee member – particularly finance and governance committees – Council and Board member and in the position of Honorary Secretary to Nature Foundation. Her contributions have been invaluable to the organisation. We extend our sincere appreciation and thanks to Susie.

The Nature Foundation Board continues to focus on the implementation of our Strategic Plan in a rapidly changing environment. A warm welcome to new Board directors Bec Hardy and Anne-Marie Barbaro, who attended their first meeting in August and bring a wealth of knowledge, skills and experience to Nature Foundation – you can find out more about them in this publication.

At the AGM, long-serving Directors Bob Lott (former President) and Chris Reed retired as their maximum terms of nine years were realised. Both have contributed a huge amount to Nature Foundation and where it finds itself today – a significant actor in nature conservation and engaging people in it. Chris has a continuing second role as Property General Manager for Hiltaba and Witchelina Nature Reserves, reporting to the CEO. I am sure you will join me in thanking them and wishing them well.

I hope to see some of you in person at upcoming events before the end of 2020. Despite the many challenges we have all faced this year, we also have much to celebrate.

Kind regards

Jan Ferguson OAM

Board Chair

Butterfly at Witchelina

From the CEO
Hugo Hopton

Hello to you all. On my mind is science. What is it? When do we take note of it and when do we ignore or distrust it? Why is science important?

All of us are affected by science every day, whether it is the food we eat, the clothes we wear, the technology we use, travel or the health services we access.

Despite the willingness of all humans to accept the benefits of science, it takes little time to find in the media, or indeed in conversation, criticism of science, or at the very least the seeding of doubt about a body of science.

So why is this? It seems to me that it is because we are complex beings who are part of diverse communities. Some of us are inspired by the contest of ideas that science and debate bring, while others are quite resistant to new ideas. The reasons for this are myriad – from vested interest, through to disinterest, prejudice, ideology, competing bodies of knowledge, or suspicion about science and scientists.

Nature Foundation, for all of its history, has valued and promoted science through its research grants program, featured in this edition. Research findings also translate to very practical methodologies and landscape and ecological management. Recently, our Science and Knowledge Program Manager, Alex Nankivell developed a method of fauna survey which uses thermal imaging binoculars at night, with data collected in a pattern and in a way that can tell us the populations of fauna in different vegetation types. This in turn helps understand the trends in vegetation diversity and condition that we measure. The method is now being trialled by other organisations and agencies.

Through the COVID lockdown, we took the opportunity to work on our priorities, reassess the resources needed and to improve our systems. As a result, we have grown our capacity. We are excited to welcome three new staff members to Nature Foundation: Liam Crook as Offsets Program Coordinator, Jane Cooper as Executive Assistant to the CEO, and Board support, and Claire Stephenson as Revitalising Conservation in South Australia Program Manager. We also farewell Conservation Projects Officer Amy Ide with sadness and best wishes as she takes up a new role working on the management of the Coorong.

The need for organisations such as Nature Foundation continues to grow. We have been providing support, considered views and advice, together with dozens of nature conservation and primary industries organisations to state and federal governments on policy matters such as bushfire recovery, the federal review of environmental protection legislation, nature conservation COVID jobs packages and on the review of the South Australian Pastoral Land Management and Conservation Act. All are of significance for the future protection and management of landscapes, and threatened species of plants and animals. In some cases, those protections are being legislatively reduced at the very time when they need to be strengthened in response to the local and global species extinction crisis and climate change.

Nature Foundation is not standing still though. Here is a bit of a snapshot of just some of the projects we are working on:

- Revitalising Private Conservation in South Australia – with almost 200 small grant applications received from current or aspiring Heritage Agreement owners. An initiative of the South Australian Government, the $3m two-year pilot project has begun with gusto. Further grants calls will be made in 2021.
- Nature Foundation will soon commence the ten-year OZ Minerals project on a pastoral property, South Gap to protect the EPBC listed Plains Mouse.
- Native fish surveys with Nature Glenelg Trust – Aquasave continue at Watchalunga Nature Reserve, as does revegetation and weed control through Goolwa to Wellington LAP.
- Water for Nature – new Regent parrot-related sites are scheduled to be watered.
- The pioneering Carbon farming initiative at Hiltaba Nature Reserve is proceeding, including positive discussions about partnering with the Traditional Owners.
- Kids on Country – it is wonderful that we have been able to run three post-COVID lockdown camps this year. The Kids on Country Online program also looks fantastic.
- New land – we are continuing to receive a range of enquiries about gifts, acquisitions or partnerships to protect more of South Australia.

If you would like to help us help nature and nature science, we would love you to donate to our twin spring appeals, to help us do more for the amazing flora and fauna of this state, and the legacy we will leave for future generations.

Again thankyou for your support which is provided to us in so many ways. Please don't hesitate to make contact with me.

Hugo Hopton

Chief Executive Officer

ISABELLE ONLEY

CONSERVATION GENOMICS

and Adaptation of Translocated Greater Stick Nest Rats Under Climate Change

In 2019 Isabelle Onley, a PhD candidate at The University of Adelaide, received a Nature Foundation Grand Start grant to support her field work.

This category offers funding of up to $3000 for one year to PhD and Masters students and prioritises projects that align with Nature Foundation's research priorities, including those outlined in our Science Strategy.

Isabelle is exploring the effects of translocation and heat stress on Greater Stick-nest Rats moved from Reevesby Island, off Eyre Peninsula, to the Arid Recovery Reserve near Roxby Downs where climatic conditions are generally warmer and drier. She conducted field work to measure nest temperatures and analysis of genetic samples with the aim of informing future translocation programs of threatened species into arid areas, particularly in the face of climate change.

The project compares the genetic diversity of a recently translocated population of Greater Stick-nest Rats with the diversity of historical populations prior to the genetic bottleneck caused by the species' extinction on mainland Australia. It also aims to identify whether selection has occurred following translocation to increase resilience to heat stress, given the considerable difference in environmental conditions between Arid Recovery and Reevesby Island.

DNA sequencing of Greater Stick-nest Rats at Arid Recovery revealed genomic differentiation from its founding populations at Monarto, Reevesby Island and the Franklin Islands. Further research is required to determine whether this represents adaptation to heat stress following reintroduction to an arid environment. If so, the translocated population has become more resilient to the conditions predicted under climate change, and this may inform management strategies for future conservation efforts in a warming climate. Preliminary results of kinship analysis also suggest that the species demonstrates female philopatry, wherein males disperse and females remain in the nests over generations.

Highlights of Isabelle's research findings include:

- Morphological analysis of Greater Stick-nest Rat museum specimens revealed significant size differences between Franklin Island individuals and most historic mainland populations.
- Pilot data from loggers installed inside Greater Stick-nest Rat nests suggest the addition of rocks improve thermal capabilities under extreme temperatures.
- Greater Stick-nest Rats on Reevesby Island appear to favour coastal rock ledges over inland boxthorn habitat.
- Relatedness analysis of Greater Stick-nest Rats at Arid Recovery suggest a high degree of relatedness between females within nests, possibly a result of female philopatry.
- Genomic differentiation is evident between the translocated Arid Recovery population and its founders.

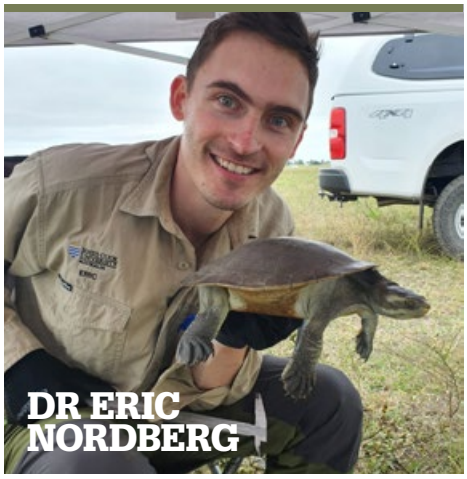
This project presents a unique opportunity to study the effects of climate change in an endemic species over several generations using cutting-edge DNA technology. The study has significant conservation implications for threatened species Australia-wide.

Nature Foundation is so pleased to be supporting such important research for conservation and looks forward to sharing more outcomes of the research.

ANNOUNCEMENT OF 2020 RESEARCH GRANT RECIPIENTS

Thirteen grants totalling more than $64,000 have been awarded by Nature Foundation to recipients of our 2020 research grants round.

Through our research grants program we have provided almost 420 grants valued at over $1.7 million to university students and research institutions for their important nature conservation projects since 2003. These grants are made possible thanks to generous donations from our members and supporters, a bequest from Roy and Marjory Edwards, and through our partnership with the Scientific Expedition Foundation.



Dr Eric Nordberg and Kreft's River Turtle.
Credit: Rishab Pillai

Dr Eric Nordberg is the recipient of the 2020 Mike Bull Award for Early Career Nature Scientists, receiving a medal for academic excellence and a grant to support his career. Eric's research interests and philosophies towards mentoring students align closely with those of the late Professor Mike Bull.

Eric will use his grant to broaden the scope of his research into the unusual 'nocturnal basking' behaviour of freshwater turtles in north Queensland rivers. His preliminary surveys highlight that in the Ross River these turtles 'bask' at night on logs out of the water, which has not been documented elsewhere in Australia.

Find out more about the Mike Bull Fund on our website.

Dympna Cullen weighing a small mammal in the field.
Credit: Jack Dickson.

Dympna Cullen, a PhD candidate from UNSW, is the recipient of the 2020 Roy and Marjory Edwards Scholarship. The scholarship provides funding of $24,000 over two years for her research on refuges of the Crest-tailed Mulgara, a threatened desert mammal.

A great mystery for Australian desert ecologists is where populations of small mammals persist during droughts. Dympna's project aims to identify the attributes and connectivity of Mulgara refuges after prolonged drought so these refuge habitats can be appropriately managed in the future. Dympna will undertake field work on pastoral properties and conservation reserves in north-west NSW through to Lake Eyre in South Australia.

Sarah Barker in front of the natural and artificial habitat structure holding two Gidgee Skink inhabitants.
Credit: Sarah Barker

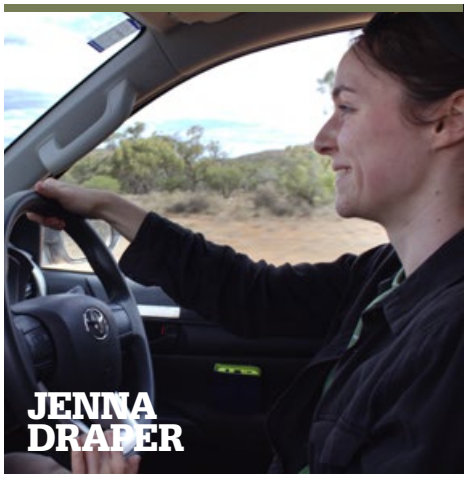
Sarah Barker, an Honours student at Flinders University and recipient of the 2020 Nature Foundation Scientific Expedition Foundation RL & GK Willing Grant, will investigate family living – considered very rare in lizards and snakes – in Gidgee Skinks at our Witchelina Nature Reserve.

Sarah's Honours project aims to determine if habitat quality influences the social structure of Gidgee Skinks. Habitat quality has been manipulated by adding wood and tin to create artificial 'crevices' for the lizards. Sarah's grant will support her to sample these locations and compare them to control areas to see if habitat manipulation has changed the lizards' social structures.

Kyle Brewer with a Quokka at Adelaide Zoo.
Credit: Kyle Brewer

Supported by a Grand Start grant, University of South Australia PhD candidate **Kyle Brewer** will further develop innovative native fauna population protecting implants (PPIs).

The small, microchip-sized implants contain a 'core' of poison and an outer responsive polymer coating. Injected under an animal's skin, the polymer coating is stable for that animal's life. However, if the animal is eaten by a fox or feral cat, the implant is also eaten and breaks down in the predator's stomach, killing it and thereby protecting native animal populations from that predator.



Jenna Draper in the field at Hiltaba.
Credit: Brock Hedges

Jenna Draper, a PhD candidate at The University of Adelaide, is exploring the adaptations and ecological significance of the Mallee Riceflower in the arid zone.

Jenna's Grand Start grant will support her field work at our Hiltaba Nature Reserve and fund laboratory testing of plant samples. Mallee Riceflower is dioecious, meaning that there are separate male and female plants, and Jenna will study plant-pollinator interactions in the species. Her project aims to support plant conservation and increase awareness of arid zone dioecious plants.

Diego Guevara measuring native vegetation in Fleurieu Swamps. Credit: Diego Guevara

As part of his PhD research at The University of Adelaide, **Diego Guevara** aims to improve restoration techniques in grassy ecosystems by investigating the links between different restoration techniques and microbial communities in the soil.

Diego's project aims to assess the effectiveness of topsoil removal and soil microbial inoculation for the establishment of native perennial grasses. He will undertake experiments at our Para Woodlands Nature Reserve near Gawler and his Grand Start grant will fund this field work as well as analysis of soil samples.

Alex Thomsen in the field.
Credit: Alexandria Thomsen

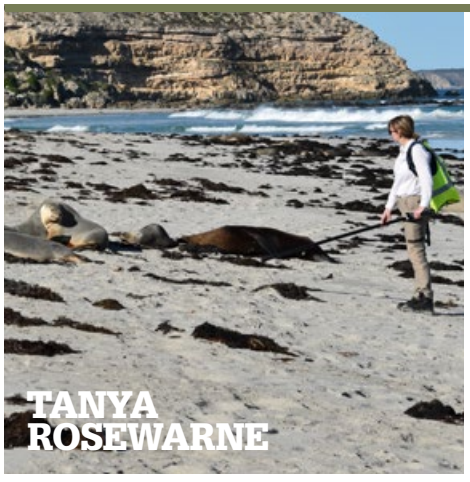
Alexandria Thomsen, PhD candidate at the University of New South Wales, will utilise her Grand Start grant to better understand how changing fire season, brought on by fire management, impacts orchids in the Mount Lofty Ranges of South Australia.

Alex will conduct experiments to assess how different orchid species recover after different seasonal fires. The results will help identify how to best manage and conserve endangered orchid species by knowing the most optimal time to burn when particular orchids are present.

Supported by funding from a Grand Start grant, University of New South Wales PhD candidate **Baptiste Wijas** will investigate the impacts of kangaroo overgrazing on termites, which are an essential food source for small mammals and lizards in arid Australia. Termites provide food for many organisms in arid ecosystems by mobilizing nutrients stored in dead vegetation.

Baptiste's PhD project aims to provide information that land managers can use to make informed decisions regarding the management of grazing pressure in reserves.

Baptiste Wijas holding a Woma python (*Aspidites ramsayi*) in the Strzelecki Desert.
Credit: Dympna Cullen



Tanya Rosewarne, a Masters student at Macquarie University, will use her Grand Start grant to support research on the preferred breeding locations of threatened Australian Sea Lions at Seal Bay on Kangaroo Island. Seal Bay is home to the third largest colony of Australian Sea Lions and is a vitally important breeding location for the species and a well-known tourist destination.

Tanya's grant is funded through our Australian Sea Lion Fund and her project aims to analyse changes in breeding locations, determine what influences these sites and make recommendations for park management such as future refuge areas to minimise disturbance.

Tanya Rosewarne at Seal Bay, Kangaroo Island with Australian Sea-lions (*Neophoca cinerea*).
Credit: Suzanne Gregor

DAPHNE MCLEOD

Aerobiome sampling stand set up. Chris taking care to attach each petri dish. Credit: Daphne McLeod

Flinders University Honours student **Daphne McLeod** will use her Grand Start grant to investigate the association between airborne microbial (bacterial community) diversity and vegetation diversity surrounding urban sports fields in metropolitan Adelaide.

Biodiverse urban greenspaces provide health benefits but what causes these health benefits remains elusive, with the microbiome a likely candidate. This pioneering project aims to help support the conservation of urban biodiversity, improve health of city-dwellers, and result in economic savings through reduced spending on non-communicable diseases linked to the microbiome (e.g. inflammation and allergy disorders).

KENDALL WHITTAKER

Pygmy Bluetongue lab work. Credit: Kendall Whittaker

Supported by a Grand Start grant, Flinders University Honours student **Kendall Whittaker** will research genes, and how they might influence mate choice, in threatened Pygmy Bluetongue Lizards.

The Pygmy Bluetongue Lizard is under threat from climate change – and understanding how to safely move (translocate) lizards to mitigate against this is the next step in the species' conservation. Determining the mechanisms used for mate choice will help choose the most appropriate animals for translocation. Kendall will use genes involved in mate choice and parasite resistance to determine if mates are chosen based on the variants at these genes.

PROF. SIMON GOLDSWORTHY

Australian Sea-lions (*Neophoca cinerea*) mother and week old pup at Seal Bay, Kangaroo Island. Credit: Tanya Rosewarne

Professor Simon Goldsworthy. SARDI, PIRSA & The University of Adelaide.

Professor Simon Goldsworthy will use innovative satellite tags and camera loggers to understand and map critical foraging habitat of threatened Australian Sea Lions.

His Research Project Grant, funded by our Australian Sea Lion Fund, will fund research to track the at-sea movements of sea lions, identify key foraging areas within marine parks, and attach miniature underwater cameras to map their critical habitats and understand their feeding behaviour.

Data produced will inform species management and provide engaging immersive videos and maps to educate, inspire and facilitate awareness and support for Australian Sea Lion conservation, and the important role of marine parks in their management.

DR NICK WHITEROD & DR SYLVIA ZUKOWSKI

Dr Nick Whiterod with Large Murray Short-necked Turtle (*Emydura macquarii)* sampled Watchalunga Nature Reserve. Credit: Aquasave-NGT

Dr Nick Whiterod & Dr Sylvia Zukowski – Aquasave-Nature Glenelg Trust. A Research Project Grant will fund **Dr Nick Whiterod** and **Dr Sylvia Zukowski** from Aquasave-NGT to survey the fish community at our Watchalunga Nature Reserve where a diversity of aquatic habitats support regionally important native freshwater fish.

Building on previous surveys at Watchalunga, Nick and Sylvia will also use environmental DNA (eDNA) sampling to target additional habitats that previously supported nationally (and internationally) threatened fish species, namely Murray Hardyhead and Yarra Pygmy Perch. eDNA methods detect and identify organisms without capture or observation, even if they occur at low densities. The outcome of the project will provide further information to manage habitats and freshwater fish across the reserve.

Mark Lethbridge and Hannah Cady at one of the base stations installed to remotely track the movement of radio collared YFRW at Mt Friday

by Alex Nankivell

YELLOW-FOOTED ROCK-WALLABY RECOVERY PROGRAM

In 2019 Nature Foundation received funding from the Wettenhall Environment Trust's Small Environmental Grant Scheme for our Yellow-footed Rock-wallaby (YFRW) recovery program at Hiltaba Nature Reserve. Our sincere thanks to Wettenhall Environment Trust for their support to help increase the population of nationally threatened Yellow-footed Rock-wallabies in the Gawler Ranges region.

The recovery program concentrates on threat abatement, predation, over grazing and competition for resources, while monitoring habitat interaction and YFRW population, and adapting conservation management plans as needed.

The aim is to increase population levels of the Yellow-footed Rock-wallaby in the Gawler Ranges region thus also increasing dispersal of the species. There has been past culling of feral species such as goats, foxes and rabbits at Hiltaba to minimise predation and competition for resources, which in turn has produced positive results for the YFRW population. However, funding is required to ensure monitoring of the population is undertaken as part of the ongoing management of this species at Hiltaba Nature Reserve.

THE MAIN AIMS AND OUTCOMES

1. **Quantify the size of the YFRW population and monitor population viability at Hiltaba using ethical capture methods such as ear tagging (marking) and recapture for population dispersals.**

   Outcome: We have calculated abundance using indices (independent hits/camera trap nights) nights for several species including Yellow-footed Rock-wallaby, goat, euro, echidna, cats and other fauna. We have also calculated abundance using Applied Hierarchical Modelling- N-Mixture models. We haven't yet begun ear tagging Yellow-footed Rock-wallabies for use in mark-recapture population assessments. We plan to begin this in subsequent trapping surveys.

2. **Radio collaring a small number of the population to monitor movement and gain real time results. Motion cameras will also be utilised to also monitor movement and feeding habits.**

   Outcome: We completed two camera trap surveys at 10 sites in 2018 and 2019. This has provided useful data relating to abundance and occupancy of the species mentioned above. We completed one cage trapping survey where we were able to radio collar 3 animals. We still have 7 collars to deploy and hope to do that later this year. The data received from the 3 animals has already revealed valuable insight into habitat use at Mt Friday on Hiltaba.

Yellow-footed Rock-wallabies (*Petrogale xanthopus xanthopus*) observed on a camera trap during surveys.

3. **Quantify the size of the goat population and monitor their impact on available food resources and vegetation condition at Hiltaba.**

   Outcome: We have completed rapid site surveys assessing habitat suitability for YFRW at several historic YFRW sites. The goat population has been calculated as a relative abundance index from camera traps and is heavily influenced by seasonal migration.

4. **Maintain accurate records in project database for reporting purposes.**

   Outcome: Accurate records have been maintained on the Nature Foundation server. The project is ongoing: data will continue to be gathered and analysed to further understand and monitor the YFRW population at Mt Friday.

The key results of this monitoring project as they relate to the outcomes are summarised below:

- With data obtained from camera trap surveys in 2018-2019 we were able to model abundance using the N-Mixture models. In 2018, an estimated 35 YFRWs were living within the project area compared with an estimated 32 wallabies in 2019. This is consistent with the raw camera trap abundance index data (independent hits/total camera trap nights), suggesting that the YFRW population at the project site has been stable between 2018 and 2019. We plan to compare this method with mark recapture methods once we have begun ear tagging animals.
- The results of the radio collaring indicate the current habitat use of the three collared animals. This differs from what we had expected. This was reinforced by the camera survey that also showed a change in detection at camera trap sites. As a result of these findings we are planning to expand our survey area to see if the wallabies are dispersing to new areas on the reserve.

Aerial map showing locations of Yellow-footed Rock-wallabies at Mt Friday based on initial radio-tracking data from three radio-collared individuals (pink shapes). The yellow oval shows the expected area of habitat use. The locations of Base Stations 1 and 2 are indicated, as is the proposed location of a third base station.

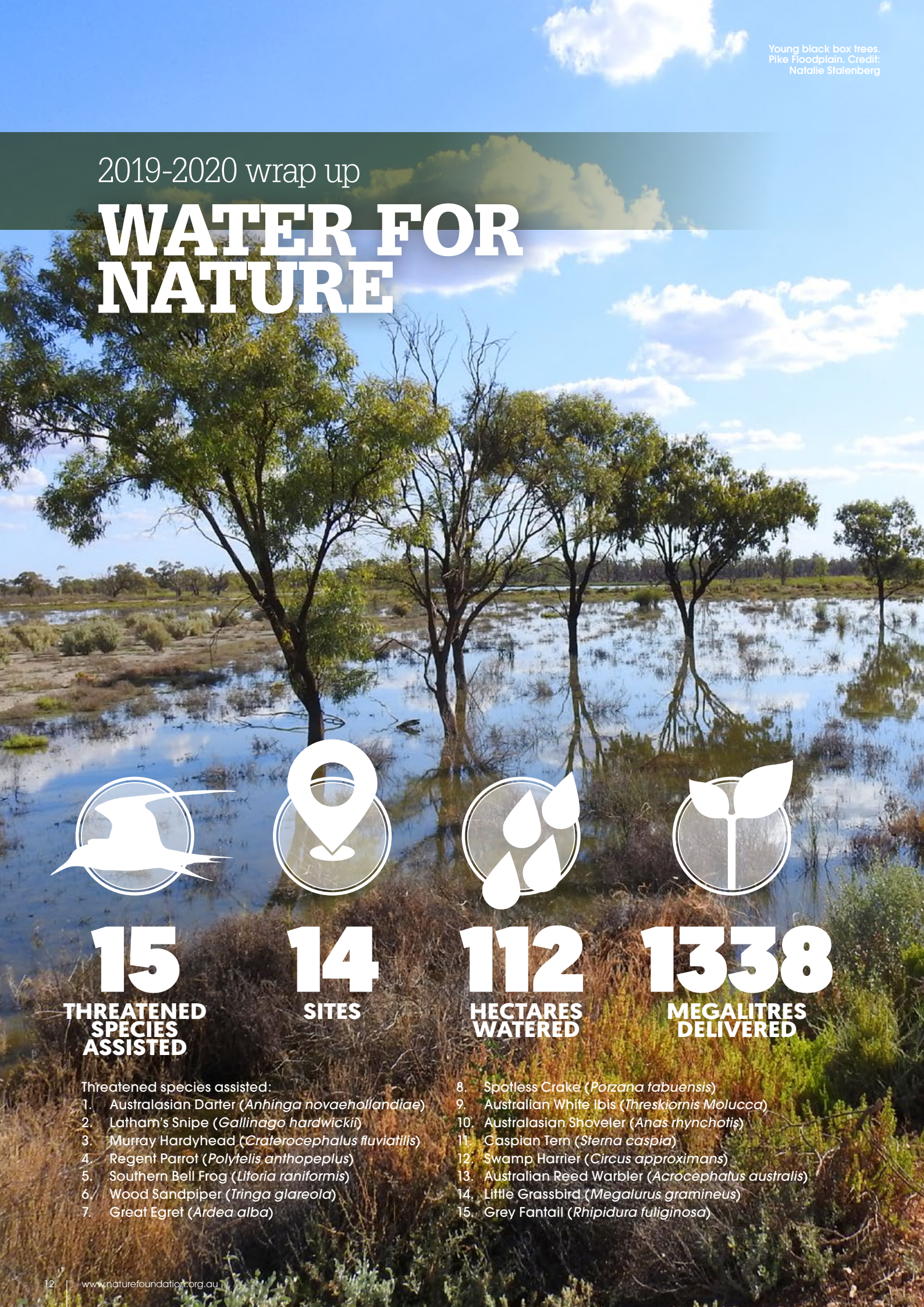
Above is an aerial map showing locations of YFRWs at Mt Friday based on initial radio-tracking data from three radio-collared individuals (pink shapes). The yellow oval shows the expected area of habitat use. The locations of Base stations 1 and 2 are indicated, as is the proposed location of a third base station.

- By the same method mentioned above we used N-Mixture models to assess abundance of goats within the project area. In 2018, we estimate there were 60 goats within the project area compared with 71 in 2019.

You can read the full progress report which reports in more detail on the outcomes, results, and innovations arising from the work completed to date, on our website.

Nature Foundation is seeking ongoing funding for this project for the next three years to continue this vital conservation work at Hiltaba Nature Reserve. The budget required for 2020/21 is $12,000 and to continue the Yellow-footed Rock-wallaby Recovery Program further Nature Foundation is seeking the same amount for 2021/22 and 2022/23.

If you would like to contribute to the Yellow-footed Rock-wallaby program please visit: naturefoundation.org.au/support-us/our-appeals/yellow-footed-rock-wallaby-recovery-appeal.



Young black box trees. Pike Floodplain. Credit: Natalie Stalenberg

2019-2020 wrap up

WATER FOR NATURE

15 THREATENED SPECIES ASSISTED

14 SITES

112 HECTARES WATERED

1338 MEGALITRES DELIVERED

Threatened species assisted:

1. Australasian Darter (*Anhinga novaehollandiae*)
2. Latham's Snipe (*Gallinago hardwickii*)
3. Murray Hardyhead (*Craterocephalus fluviatilis*)
4. Regent Parrot (*Polytelis anthopeplus*)
5. Southern Bell Frog (*Litoria raniformis*)
6. Wood Sandpiper (*Tringa glareola*)
7. Great Egret (*Ardea alba*)
8. Spotless Crake (*Porzana tabuensis*)
9. Australian White Ibis (*Threskiornis Molucca*)
10. Australasian Shoveler (*Anas rhynchotis*)
11. Caspian Tern (*Sterna caspia*)
12. Swamp Harrier (*Circus approximans*)
13. Australian Reed Warbler (*Acrocephalus australis*)
14. Little Grassbird (*Megalurus gramineus*)
15. Grey Fantail (*Rhipidura fuliginosa*)

Warren Milera and David Saloman

Helen Palmer

KIDS ON COUNTRY ONLINE

This year began with lots of discussion and liaising with schools and industry partners and all systems go for the eight camps scheduled. Two days before heading out to Witchelina for the first camp, the world changed – Covid-19 led to postponing the on-country workshops and camps.

Keen to continue and sustain the growing momentum of the program and most importantly keep Aboriginal young people, schools and agencies engaged in Kids on Country, Nature Foundation decided to develop, create, and transition to an online program.

Over the past three months, the team have been busy reworking activities to engage young people and teachers in the online program. Katie, Helen, Warren and David 'Sal' Salomon from Simply Splendid Productions spent a week at Witchelina filming stories on:

- Bird Identification
- Camera Traps
- Plant identification
- Vehicle Maintenance
- Stories of Inspiration
- Remote Area Safety
- Recycling
- Fence Removal
- Communication
- Geocaching
- Aboriginal Astronomy

Petra and Fred, the Rotational Managers at the time, were very generous with their knowledge of Witchelina and shared their stories with the KOC team, which gave Sal some great ideas to investigate for the online program.

The team also spent a week filming direct to camera at Nature Foundation's Prospect Office, which included sessions with Nature Foundation staff, who will deliver part of the learning along with special guest presenters.

The program will consist of broadcasts, pre-recorded introductions of topics by Katie Perry, the Kids on Country Coordinator, presentations, and activities. The 'live' broadcasts will allow students/participants to ask questions and engage with the KOC team via Zoom.

If you are interested in partnering with Nature Foundation to sponsor a Kids on Country program, please contact Caroline Nefiodovas.

WILDLIFE RECOVERY FUND GRANT RECIPIENTS

Last summer we asked for your help – and you stepped up with incredible generosity, donating over $450,000 towards the Wildlife Recovery Fund. Nature Foundation and National Parks and Wildlife Service South Australia are delighted to announce that your donations have been granted to 20 recipients to help our wildlife and native flora recover from the South Australian bushfires!

The grant recipients will share the funds to help threatened animals like the Little Pygmy Possum, the Mallee Fowl and threatened plant communities such as the Fine-headed Spear Grass to survive – or even thrive.

Wildlife Recovery Fund grants distributed by region

Region	WRF Funding
Hills and Fleurieu	$177,283
Kangaroo Island	$146,361
Limestone Coast	$25,000
Eyre Peninsula	$49,925
Multiple	$50,000
Total	**$448,569**

Thank you to all who donated to the Wildlife Recovery Fund and to all who applied for funds, and congratulations to the 20 grant recipients. We look forward to sharing the story of the grant recipients in the months ahead.

REVITALISING PRIVATE CONSERVATION IN SA PROGRAM LAUNCHED!

We're excited to announce the new Revitalising Private Conservation in South Australia program!

Primary producers and conservation landholders will be able to access expertise and resources for practical on-ground conservation work, which will improve the quality of their native vegetation and the financial sustainability of their properties. Good for farming, good for conservation!

The Revitalising Private Conservation in South Australia program is an exciting new collaboration between the primary industries and conservation sectors. It provides existing and aspiring Heritage Agreement owners with an opportunity to access advice, connect with other heritage agreement owners, and access grants to plan and undertake important nature conservation works on their properties. It aims to expand the number, extent and quality of protected areas of native vegetation on private land in South Australia.

Nature Foundation is thrilled to deliver this important initiative in partnership with Conservation SA, Livestock SA, Trees For Life and Nature Conservation Society of South Australia.

Minister for Environment and Water Hon David Speirs MP visited a farm at Macclesfield on 4 August to launch the $3 million program, which is funded by the Government of South Australia and includes a revamped Heritage Agreements grants program.

Read more about the program and apply for a Heritage Agreement Grant on the website: www.revitalisingconservationsa.org.au.

30,000 TREES FOR BUSHFIRE-AFFECTED REGIONS

Nature Foundation recently had the pleasure of catching up with Rob Laffer, owner and Managing Director of McLaren Vale Natives.

In response to the devastating bushfires earlier this year, Rob decided to propogate 10,000 trees to distribute to some of the worst-affected regions. He put out a call on Facebook and within a week had 500-700 volunteers at his nursery to help. Such was the generous response, the group ended up tripling their efforts to seed and dibble 30,000 trees in one day!

All of the trees were distributed to bushfire-affected regions in Kangaroo Island, the Adelaide Hills and Yorke Peninsula to support revegetation and habitat restoration.

McLaren Vale Natives also generously hosted the launch of the Wildlife Recovery Fund by Minister David Speirs and Nature Foundation Chair Jan Ferguson OAM. This was part of the McLaren Vale Biodiversity Project's 'Revegetation for a Cause' event.

Rob has previously volunteered his time for grader and loader work, and fencing at Witchelina Nature Reserve. He recently donated quandong trees for planting at Witchelina and hopes to visit Hiltaba in the near future. Our sincere thanks to Rob for all of his fantastic work for bushfire recovery and nature conservation in South Australia.

In addition to a range of native trees prefect for landscaping and bush regeneration, McLaren Vale Natives also specialise in growing bush tucker foods, which they distribute to restaurants throughout South Australia.

You can learn more about McLaren Vale Natives and purchase plants online via their website: www.mclarenvalenatives.com

VALE

ELIZABETH LAW-SMITH OAM

Nature Foundation was deeply saddened to hear of the passing of Elizabeth Law-Smith OAM on 24 September 2020.

Nature Foundation came to know Elizabeth through her vision, strength and generosity in the establishment of the Para Woodlands restoration project, in memory of her late husband David. The concept remains unrivalled and was made feasible through the donation of land and funds, and Elizabeth's part in the development and stewardship of the restoration, and the partnership which guides it today.

Elizabeth was a committed conservationist with extraordinary vision. In 2003, she donated 118 hectares of the family farm to Nature Foundation, with a further 232 hectares sold to the South Australian Government. Managed together they created Para Woodlands Nature Reserve to ensure the land was rehabilitated to its natural habitat. Mrs Law-Smith also made a significant donation to create a capital fund to finance research, revegetation and ongoing conservation works on Para Woodlands. Through further generous donations by Mrs Law-Smith, neighbouring land was acquired to bring the total area of Para Woodlands to 500 hectares.

A transformation has occurred on what was farming land with more than 100,000 native plants and 1,000 kilograms of native grass seeds planted to help convert the woodlands from exotic to native species. The revegetation work has supported the return of a wonderful diversity of Australian flora and fauna, including threatened woodland bird species such as the Diamond Firetail and Red-capped Robin, in decline in many other parts of the Mount Lofty Ranges. Elizabeth was a keen participant in the planting working bees in the early days, as shown in the great photo above where she is pictured with a planting day volunteer.

Elizabeth has ensured that her conservation legacy will live on. We at Nature Foundation will do our best to celebrate her contribution on an ongoing basis, and hope that the thought of the biodiversity being conserved and restored will provide tangible positivity for the family at this time.

Elizabeth Law-Smith was awarded the Medal of the Order of Australia (OAM) in the Australia Day 2019 Honours List, in recognition of her nature restoration vision and incredible generosity.

On Behalf of the Board and staff, past and present, and Nature Foundation's wide band of supporters and members, we pass on to the wider family our condolences on the passing of a wonderful woman.

A VISIT TO HILTABA NATURE RESERVE

L to R: Pete and Nicki Crawford with Justin Jay

by Nicki Crawford

My partner Peter and I, along with volunteer Steph Horwood, spent our first visit to Hiltaba Nature Reserve assisting Justin Jay to carry out a vegetation assessment – how very fortunate for us to see the Reserve through the eyes of an experienced hand in such landscape!

In a week-long visit, we travelled around much of the property revisiting sites of previous vegetation assessments, completing two excellent walks and helping rotational managers Lange and Inara clear old fencing wire.

The sites for assessment are located 1.5 km out from stock watering points used in pastoralist times. For the more detailed assessments, we counted all the perennial vegetation located in a 4m wide x 100m long strip, then recorded observations of the wider area, including vegetation condition and additional varieties. Given a lack of rain in recent times and long-term impact of stock grazing, it was no surprise to observe minimal improvement in perennial vegetation at the sites we visited.

We learnt by being immersed in the task, identifying pearl bluebush and other Maireana varieties, saltbushes, sclerolaena spp etc. We were delighted at finding plants such as grevillea and eremophila in flower but less enthusiastic about the numbers of wombats, roos and emus and occasional sighting of goats.

Justin Jay was generous in sharing his knowledge and very patient with we novices who were completely new to vegetation transects.

Of the many highlights, we were impressed by the diverse countryside of the Barbara Hardy Walking Trail and the Warren Bonython Loop Walk, and it was nice to have some success at plant identification. We were amazed at rock walls built in the gorges to dam scarce water.

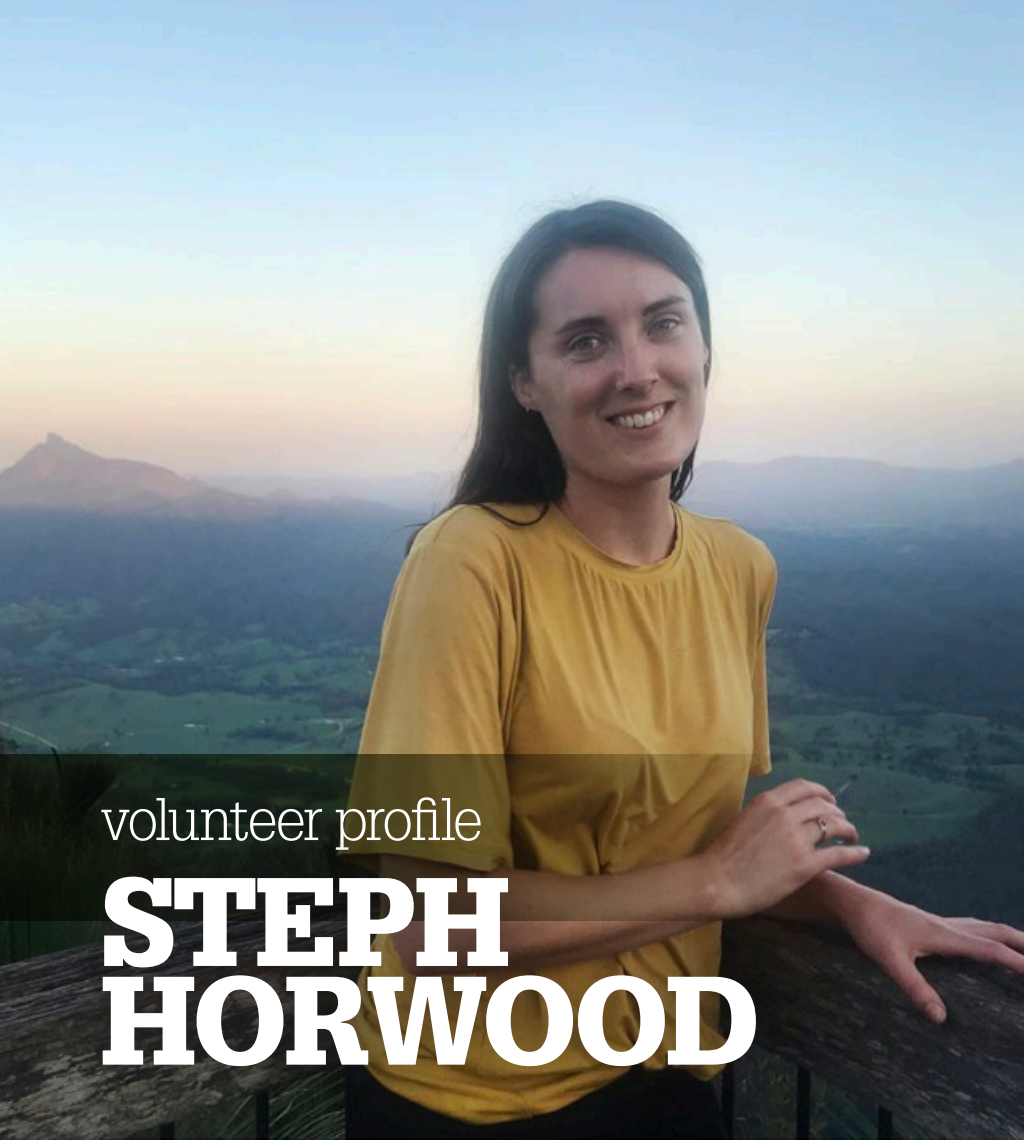
Lange and Inara invited our group to a BBQ with others working in the nearby area. The Hiltaba homestead and its gardens make a delightful setting for enjoying hospitality under the stars. It's good news that the old shearing shed is to be refurbished and the floor rebuilt.

All four of us in the "vegetation team" were amazed at the number and density of the wombat population. Much laughter was had at their antics when they retreated to their warrens as our vehicle approached.

Aside from a week in the comfort of Hiltaba's jackaroo cottage, we admired the silo art at Kimba, camped at Fowlers Bay Caravan Park and took a whale watching cruise to see a female Southern Right passing through the bay, sampled oysters at Ceduna and Smoky Bay, caught tommy ruffs off the rocks south of Streaky Bay and snorkelled with the giant cuttlefish at Stony Point, outside of Whyalla. A shout out to Whyalla Dive Services – we were very appreciative of hiring wetsuits appropriate for chilly water!

Our trip's timing was almost perfect – being at Hiltaba before the Reserve re-opened to visitors on 1 July; however, too early for lifting of restrictions to the Head of the Bight Visitors' Centre (owned by local Aboriginal community).

We absolutely loved the Hiltaba experience and encourage all members and supporters to visit if you can.



volunteer profile

STEPH HORWOOD

Steph's background is in Mathematics and programming, and she has been studying a science degree part time for the last few years around her work as a database engineer. She was inspired to change work direction after hiking the Overland Track in Tasmania.

How did you become involved with Nature Foundation?

I became involved with Nature Foundation after the very generous Chris Daniels suggested the organisation as a potential place to learn and volunteer. I got in touch with Alex Nankivell, Science and Knowledge Program Manager, and we went from there.

What inspired you to volunteer with Nature Foundation?

I wanted to get some experience in the industry, and Nature Foundation felt ideal. I was very drawn to their approach to conservation – it was practical, with the ability to be stable over the long term and protect large and important areas of land. I love that they own such beautiful properties and do such varied conservation work within them.

What do you find most rewarding about volunteering with Nature Foundation?

I have found the generosity of the staff and other volunteers to be the most rewarding aspect of volunteering with Nature Foundation. I feel so included in the organisation and I know people are on the lookout for tasks that I am interested in helping with. This has resulted in a varied and interesting volunteer experience, from data analysis in the office (something I really enjoy) to accompanying Justin Jay and Nicki and Peter Crawford on the most recent vegetation survey at Hiltaba (refer to Nicki's article about the trip in this newsletter!). Data and vegetation are my two passions in the environmental sphere so to cover both of them with the encouragement of the staff at Nature Foundation has been great.

What are your future plans/goals/aspirations?

Over the next year I aim to finish my Bachelor of Science (Biodiversity and Conservation) at Flinders University, and then I will begin to combine my love of mathematics, GIS (geographic information system) and vegetation into a meaningful career.

Hiltaba Pretty Point walking trail. Credit: Bill Doyle

UPCOMING EVENTS

NATURE FOUNDATION ANNUAL DINNER

Saturday
21 November 2020

Please see details on back page.

WITCHELINA AND HILTABA NATURE RESERVES VISITOR SEASON

The visitor season for 2021 will be from 1st April to 31st October. We look forward to welcoming you to the reserves during these months.

Please check our website for details: naturefoundation.org.au

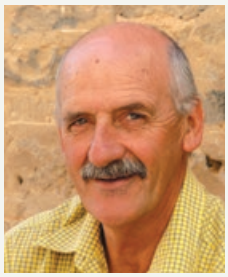
BOARD CHANGES
FAREWELL TO

SUSIE HERZBERG

It is with a sense of real gratitude mixed with sadness that we accepted Susie Herzberg's recent resignation from the Nature Foundation Board. Susie's contributions since 2006 as a Member, Volunteer, a member of Committees, particularly finance and governance committees, and as a Council and Board member and in the position of Honorary Secretary have been invaluable to the organisation. Susie has been with the organisation through much of its growth and development and been a guiding hand and an unending source of knowledge and history about its operations, which has been highly valued by all.

BOB LOTT

With a passion for the environment and a career in the arts and event management, Bob joined the Nature Foundation Council in 2003. He brought great energy and an entrepreneurial flair. He became President in 2010 until 2018, having been Vice President from 2007. Nature Foundation has certainly grown and transformed in Bob's time, with significant initiatives including the acquisition of Witchelina and Hiltaba Nature Reserves, industry partnerships, growth of the environmental offsets business, and wonderful dinners such as that celebrating Patron Barbara Hardy's 90th birthday.



CHRIS REED

Chris Reed joined Nature Foundation in 2011 just after the acquisition of Witchelina Nature Reserve. With a background in agriculture, soil conservation and natural resources management, he was soon involved in committees such as property management and significant environmental benefits. He was central in assembling the dedicated group of 25 Rotational Managers who staff Hiltaba and Witchelina on roster every day of the year, and an initiator of nature-based tourism on the two reserves. Throughout Chris been a passionate advocate and Property General Manager for Hiltaba and Witchelina nature reserves, a position he continues to hold.

WELCOME TO
NEW BOARD MEMBERS

Nature Foundation extends a warm welcome to our newest members of the Board: Bec Hardy and Anne-Marie Barbaro!

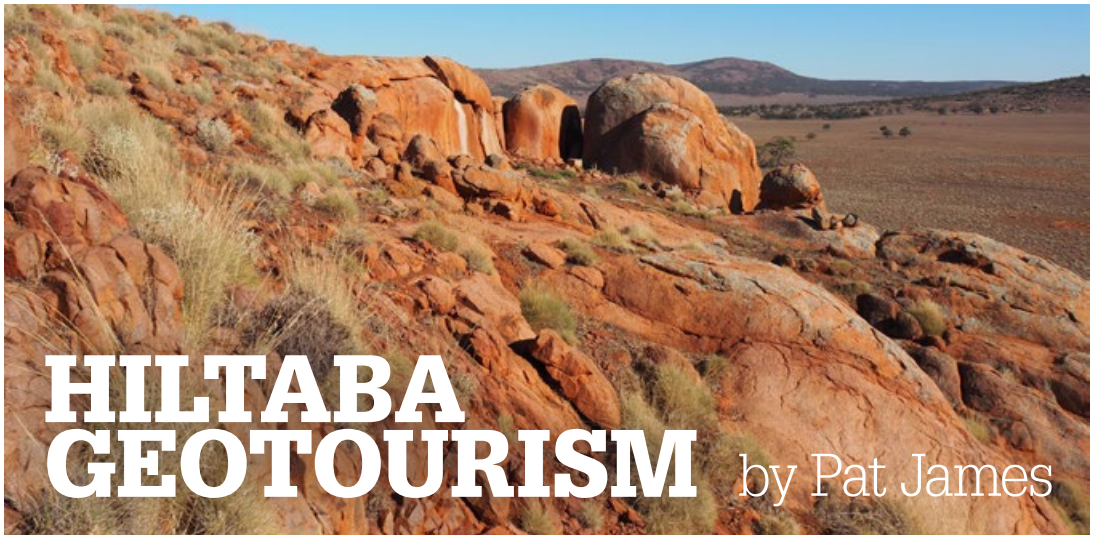
Bec Hardy has been a committee member of Nature Foundation for five years, serving on the Engaging People in Nature Committee (previously the Revenue & Marketing Committee). With her husband they are also life members of Nature Foundation. Her family has a long-standing association with Nature Foundation with Bec's grandmother Barbara Hardy being one of the founders.

Bec has a Bachelor's degree in Agricultural Science (Viticulture), holds a Grad Certificate in Business and a Diploma in the Wine and Spirit Education Trust. She owns and manages her own wine business Bec Hardy Wines with her husband Richard.

Anne-Marie Barbaro is a highly qualified senior finance leader with over 20 years' experience in the accounting industry, with roles covering management and financial reporting, audit and assurance engagements and small business taxation compliance.

She holds a Graduate Diploma of Chartered Accounting, a Bachelor of Commerce and is a Member of the Institute of Chartered Accountants and the Golden Key International Honor Society. Anne-Marie has held positions with Beach Energy, Santos, Australian Naval Infrastructure and the Institute of Chartered Accountants.

The spectacular vista of shimmering Lake Acraman hosting Australia's largest meteorite impact crater as seen from the summit of Mt St Mungo, where the rich red speckled volcanic lavas in the foreground (and within the cairn) record Australia's largest volcanic super event.



Hiltaba Homestead nestles in the broad plain beneath Mt Hiltaba as seen in the background of this photograph which shows the ruggedly outcropping unique contact between rubbly red lava on the left and smooth rounded domes and tors of Hiltaba Granite on the right. Quite rightly one of South Australia's foremost Geological Monuments.

HILTABA GEOTOURISM

by Pat James

At Hiltaba and Witchelina, Nature Foundation has two unique and outstanding areas of landscape and geology, within two of South Australia's iconic outback geological provinces, the Gawler and Flinders Ranges. They both support and underlie fascinating and sensitive biological heritage (biodiversity) and unique Aboriginal and European cultural histories.

Individually these two reserves have very different geological stories to tell. Both are internationally significant and Nature Foundation is beginning to document and develop the geological and landscape features on Hiltaba and Witchelina as geotourism sites. Their history and processes of earth evolution are displayed in the fabulous rocks, minerals and landscapes. Hiltaba is much older and sits astride one of the most ancient and stable crustal components of Australia, called the Gawler Craton, whose early earth history from 3,500–2000 million years ago records events near to the dawn of geological time.

Although they underlie the whole reserve, none of these very ancient rocks are visible on Hiltaba, because two great and very sudden global catastrophies (geologically speaking) – the Gawler Ranges supervolcanic event (GRSE) about 1,600 million years ago and the Acraman meteorite impact almost 1 billion years later wracked this area and changed its underlying geological framework forever.

Hiltaba's detailed geotourism attributes and potential are an array of low but spectacular landform ranges of inselbergs – the geological terms for island-like mountains – comprised of ancient lavas and granites from this supervolcanic event which is known to be Australia's largest Silicic Large Igneous Complex (or SLIP for short).

The Gawler Ranges supervolcanic event can now be dated most precisely to within a few million years and occurred almost 1.6 billion years ago, in our early earth history. However, 1000 million years later the largest meteorite (or strictly speaking an asteroid, as it was almost 5 km in diameter) slammed into the pre-existing volcano at Lake Acraman sending out shattering seismic waves and dust clouds around the earth probably creating a very long-lived global nuclear winter, and a splash field of large impact debris still recognisable thousands of kilometres away. The vivid salt encrusted white circular relict meteorite "crater" of the impact site is still seen spectacularly, shimmering in the distance from the summit of the adjacent Mt St Mungo.

After the supervolcano and asteroid impact, Hiltaba was weathered and eroded over geological millennia, eventually resulting in the most scenic semi-desert wooded hills and ranges and deep flat bottomed valleys filled with soils and debris shed from the surrounding uplands that we see today. These surfaces are often crusted with gravels and gibbers of red, black, white and often magnetic pebbles revealing the high iron residues formed from the breakdown of the lavas. Amongst this residual landscape sit the spectacular granite sculptures

There are currently six incredibly scenic nature walks on Hiltaba with some geotourism descriptions, while three 4WD Nature Drives each are marked and signposted with track notes and geotourism brochures which explain in detail a range of geosites. For information on how to visit Hiltaba Nature Reserve, visit the website: naturefoundation.org.au/visit-nature/visit-hiltaba-nature-reserve

NATURE FOUNDATION ANNUAL DINNER

Saturday, 21 November 2020

Adelaide Sailing Club, 8 Barcoo Rd, West Beach
7.00–11.00 pm / Members: $85 Non-members: $95

Enjoy spectacular panoramic coastal views from the balcony with canapes served while mingling with other Nature Foundation members.

Delicious dinner and dessert, with drinks available for purchase from the bar – we would love to see you there!

Live jazz and raffle. Spacious layout and configuration for tables of 8; places strictly limited so book early.

Leaping dolphin. Credit: Rebecca Clark

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HOW CAN YOU HELP?

Our dedicated members, supporters and volunteers often ask us how they can help us help nature. We value all contributions, big or small because of the difference they help us make. Below is a list of a few more ways that you can get involved.

VOLUNTEERS

We are currently seeking a retired plumber who would be happy to do volunteer work on our remote nature reserves. We are also looking for a person to provide executive support to some of our committees or working groups.

BUSHLAND FOR SALE

Have you dreamt of owning your own natural wonderland? Our Blanchetown Bushland Estate provides a unique opportunity to purchase a 900 ha block of mallee woodland just minutes from the River Murray and alive with native flora and fauna. We have three allotments remaining.

For more information visit our website at naturefoundation.org.au/conservation/bushbank-sa or contact Natalie Stalenberg on 08 8340 2880, or email: natalie.stalenberg@nfsa.org.au

ITEMS NEEDED – can you help?

If you are able to donate, fund or loan any of the following items, or provide the funds to acquire them, please phone 08 8340 2880 or email NatureFoundationSA@nfsa.org.au

- HD TV for Witchelina
- One lawnmower
- Free standing wood heater for Bookkeepers Cottage Witchelina
- 10 Deck Chairs
- Weber Q or Baby Q for Bookkeepers Cottage
- Water entitlements to assist our Water For Nature Program
- Land for nature conservation
- 1 weather station for Hiltaba and 5 for Witchelina to assist science and monitoring programs.
- Acoustic monitoring devices for bats and birds

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