WINTER 2019 | ISSUE 8

The latest news from the Great Victoria Desert...

Welcome to the Winter 2019 edition of the Great Victoria Desert Biodiversity Trust (GVDBT) Newsletter.

Since the last newsletter, the Sandhill Dunnart second phase Pitfall Trapping and Camera Survey has been completed by Greening Australia. Malleefowl walks were also conducted as part of the project. The results of this survey and recommendations for future action can be found on pages 4 and 5.

Earlier this year, the Trust hosted three presentations on recent survey work undertaken on the Sandhill Dunnart in the Great Victoria Desert. This was followed by a workshop to discuss priorities for future study and management of the Sandhill Dunnart in the GVD.

In December 2018 the Trust contracted Anditi Pty Ltd to conduct an extensive LIDAR aerial survey project to identify Malleefowl mounds in the GVD. The results of this vast project are detailed on pages 2 and 3.

The Trust is also looking at the impact of fire in the GVD, particularly its impact on the Sandhill Dunnart and the Malleefowl. A fire meeting was held after the Indigenous Desert Alliance Conference in November 2018, with a broad cross section of interested stakeholders. Following on from this, the Trust is working towards defining a fire and feral management area and a subsequent on-ground fire program.

A variety of other projects are being undertaken in the Region. The Yilka Hertiage and Landcare have some exciting new projects happening and it is hoped their new ranger team will be able to ground-truth some of the mounds detected in the LiDAR aerial survey to determine if they are Malleefowl mounds.

If you would like your project to be included in the next edition of the newsletter, in early 2020, please let us know.

Western pygmy possum

Southern ningaui

We hope you enjoy reading this edition of our newsletter. If you have any comments or questions on the articles or would like further information about the Great Victoria Desert Biodiversity Trust, please contact the Operations Manager, on **operations.manager@gvdbiodiversitytrust.org.au**

IN THIS ISSUE

IN OUR REGION

LiDAR Aerial Survey Project to Detect Malleefowl Mounds in the GVD

The Malleefowl is a nationally listed threatened species and a species of priority focus for the Trust.

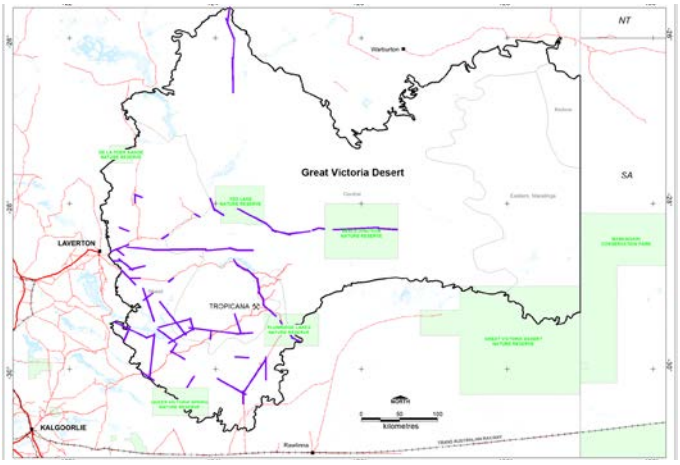
Nganamara (malleefowl) building nesting mound.
Photo: Paul Bulley and Spinifex Land Management.

Malleefowl build large egg-incubating mounds which they often use for a number of years for breeding. Nesting mounds are the main indicator used to monitor Malleefowl. While Malleefowl mounds are regularly monitored in semi-arid areas, there is very little population data on Malleefowl in arid areas.

The Trust researched a number of options for surveying Malleefowl to determine population and distribution in the GVD. LiDAR is a remote sensing method that uses light in the form of a pulsed laser to measure variable distances to the Earth. It is increasingly being used as a cost-efficient and reliable method to detect Malleefowl mounds, especially in vast and remote areas like the GVD.

The Trust contracted Anditi Pty Ltd in December 2018 to undertake an extensive LiDAR aerial survey project to detect Malleefowl mounds in the GVD. The LiDAR corridors cover a large region of the GVD as shown in the map below.

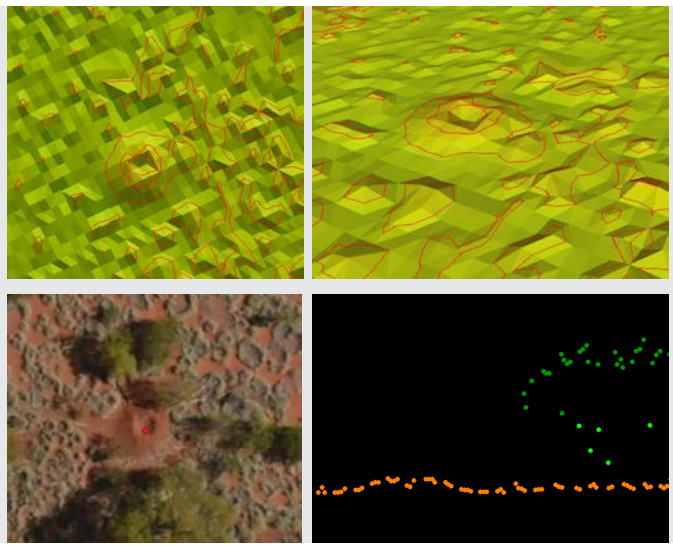
The corridors were identified with assistance and data supplied from Gaia Resources Malleefowl site selection projects in 2017 and 2018. Corridors with high suitability Malleefowl habitat and a variety of fire ages were selected.



Sixty six 600m wide corridors covering an area of over 100,000Ha in total, were flown in in extreme weather conditions in January and February 2019. The corridors were within two kilometre wide road/track buffers to make it easier for ground-truthing the mounds identified in the LiDAR aerial survey.

The initial raw data was processed by MNG who were subcontracted to conduct the aerial survey using their high accuracy Riegl LiDAR system. Once MNG had processed the raw laser point cloud to a 3D LAS point cloud, Anditi were then able to load the point cloud into the patented Anditi Engine software and classify the data for analysis for Malleefowl mound-like features.

Malleefowl mound on the 3D point cloud and on the orthophoto



Data Analysis results

The Anditi Malleefowl mound analysis algorithms look for ground features in the point cloud that best approximate a typical Malleefowl mound shape. Based on the algorithm match to shape a mound is classed from 1 to 4.

1 - Very closely matches a typical Malleefowl mound shape and is highly likely to be a Malleefowl mound

2 - Is similar to a Malleefowl mound shape and could be a Malleefowl mound

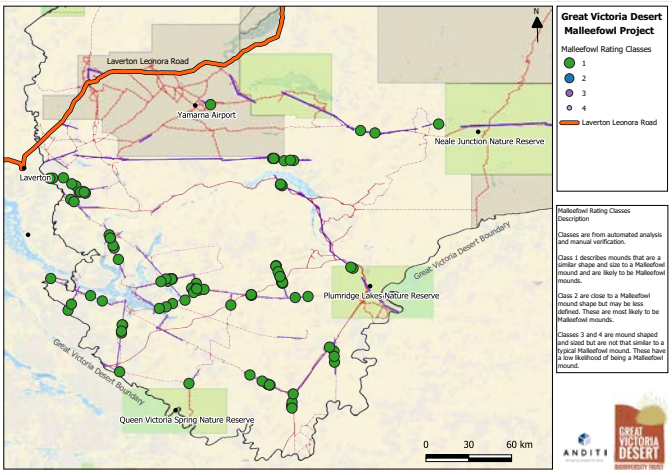
3 - Mound shape within the parameters of size for a Malleefowl mound but not very similar to a typical Malleefowl mound. *This could be an old Malleefowl mound, a mound of earth around living or dead tree/vegetation, natural hummocks around waterways, etc.*

4 - Mound shape within the size of a Malleefowl mound but not similar to a typical Malleefowl mound. *This could be a broken Malleefowl mound, a mound of earth around living or dead tree/vegetation, natural hummocks, tussock vegetation etc.*

The Malleefowl mound shape matches have been provided as a GIS dataset (Excel spreadsheet table and ESRI shapefile) with location information and rank of certainty (Class 1-4), elevation, radius and height of the mound. The 3D LiDAR data has also been provided.

The Class 1 and Class 2 mounds were verified against the orthophoto. The aerial photography used to produce orthophoto was captured simultaneously while the LIDAR survey was being undertaken.

104 Class 1 matches were found initially and on verification with the orthophoto 102 remained as Class 1 mounds which are likely to be Malleefowl mounds. 122 Class 2 matches were detected initially but on review most were found to be spinifex or similar vegetation. 22 Class 2 mounds were verified using the orthophoto. These are not definite Malleefowl mounds but are not obviously vegetation or other features.



Map showing where Class 1 matches were found.

1826 Class 3 mounds were discovered and there were 21,713 Class 4 matches. However, these are likely to be spinifex, other mound like vegetation or natural earth mounds. It is not expected many, if any, of the Class 3 and 4 matches are Malleefowl mounds. However, they could be reviewed using GIS and the orthophoto.

The Class 1 and 2 mounds will need to be ground-truthed to confirm if they are Malleefowl mounds or not; and if they are, whether they are active (currently used for breeding) or inactive (previously used) mounds.

Orthophoto

Another major output of the project is an ortho-mosaic photo which has been produced for the whole area flown for the project. Due to the extreme temperatures encountered during the aerial survey, flying early and late in the day was necessary to reduce heat effects on the pilot, equipment and LiDAR operator. Consequently, some of the imagery is darker, although features are quite discernible. There was a fire during the aerial survey which can be clearly seen in some images with all vegetation burnt and some Malleefowl mounds affected.

Further analysis and conclusions

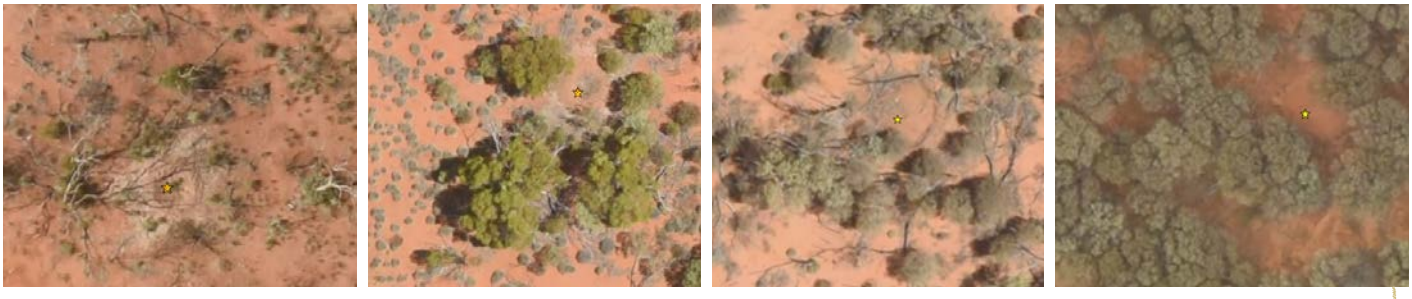
There were no Class 1 or 2 mound matches in the northern area. In the southern area they were fairly well distributed across the area surveyed. Malleefowl mounds were found in burnt areas, some in recent burns which occurred during the aerial survey. It was interesting that very few class 1 and 2 mounds were found within reserve areas and quite large concentrations were found outside reserve areas.

When comparing the mounds detected in the LiDAR survey with the Gaia Resources desktop Malleefowl Site Selection project there appears to be good correlation in some areas and poor in others. That is, there are not necessarily any mounds found in the predicted areas.

Future projects

Having this data on the mound locations and the orthophoto will allow the Trust to develop and conduct targeted on-ground projects for Malleefowl conservation. Potential projects include engaging Traditional Owners to ground-truth mounds; placing motion cameras near mounds to determine the impacts of predators and conducting fire management activities to protect areas with high Malleefowl populations. It will also allow the Trust to identify areas or habitat types to focus on for future projects.

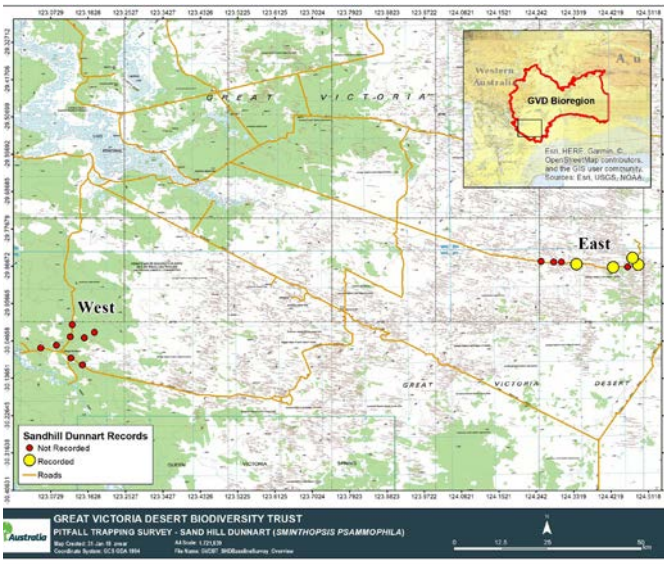
Information for this article was taken from 'Great Victoria Desert Malleefowl Mound Detection via LiDAR Project Report'. This report is available on the Trust website, http://gvdbiodiversitytrust.org.au/what-we-do/our-projects/. For further information on the project contact Gareth Evans from Anditi on gevans@anditi.com or 0405 114 811.



Orthophotos: Showing some Class 1 matches. The tiny yellow dot indicates the likely Malleefowl mound.

Great Victoria Desert Targeted Sandhill Dunnart Survey 2018

In Spring 2018, the Trust funded Greening Australia to conduct a pitfall trapping and camera survey to confirm the presence of the Sandhill Dunnart in areas where it was previously detected via motion sensor cameras in Spring 2017. The project also aimed to gather further information on the Sandhill Dunnart's ecology, habitat and range. The survey centered on two locations of likely occurrence in the south-western Great Victoria Desert (identified from the 2017 survey), which were approximately 130 km apart.



The survey involved pitfall trapping (October 2018), supplemented by motion sensor cameras (August to October 2018). Sixteen survey locations were established across the two survey sites, with pitfall trapping conducted over seven consecutive nights (a total of 1,305 trap nights) and 64 cameras deployed for a minimum of 30 days (2,526 camera nights).

What was found...



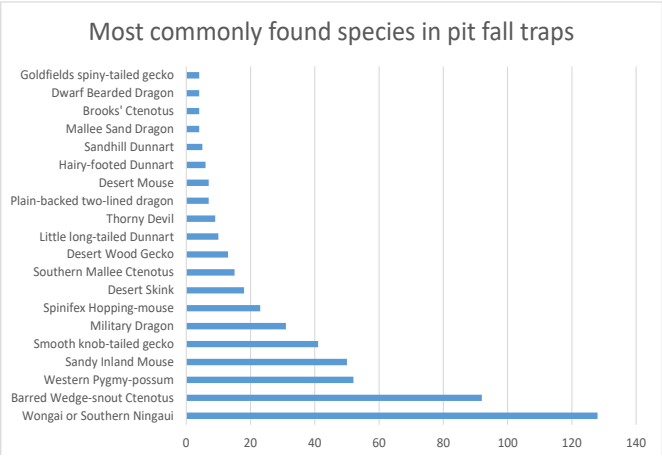








Pictures from left top to right bottom: 1. Pale knob-tailed gecko, 2. Rusty monitor, 3. Desert mouse, 4. Thorny devil, 5. Southern ningaui, 6. Western pygmy possum.



Pictures from left top to right bottom: 1. Brush-tailed mulgara, 2. Crested bicycle dragon, 3. Goldfields spiny-tailed gecko, 4. Hairy-footed dunnart, 5. Narrow banded snake, 6. Orange-tailed finesnout Ctenotus.

The Sandhill Dunnart was detected at four locations marginally extending the species known range to the east. Habitat at all locations closely resembled that occupied elsewhere in the GVD and comprised long unburnt vegetation with Marble Gum (Eucalyptus gongylocarpa), Callitris preissii, a mature shrub layer (including Allocasuarina spinosissima, Persoonia coriacea, Acacia helmsiana, Grevillea didymobotrya and Banksia elderiana) over a mature hummock grassland (Triodia desertorum with Lepidobolus deserti) all present.

The Sandhill Dunnart (Sminthopsis psammophila).

This survey has increased the species known distribution and reinforced habitat preferences observed elsewhere in the GVD. The survey has confirmed that a significant and targeted approach is required to manage known populations of the species and detect new populations.

As a result of the survey, the Trust will be:

- further validating and refining Sandhill Dunnart habitat modelling,
- interrogating and refining sites of priority for further study, particularly with regards to fire management
- reviewing the GVDBT research and management plan to establish practical strategies (eg. fire management, control of feral predators) for protecting priority habitat and addressing key threats.
- Seeking to combine monitoring efforts with Traditional Owners, mining development or others where significant on-ground presence exists; to ensure consistency, data sharing and community involvement.

While the survey focused on the Sandhill Dunnart, other species of conservation significance were recorded during target searches, opportunistically, or on the motion cameras. Significant fauna included species listed under state or national legislation (e.g. Malleefowl), priority fauna listed by DBCA (Brush-tailed Mulgara, Striated Grasswren), and regionally significant fauna (with a few regional records or recorded at the extreme of their known range). Significant flora was also recorded.

Preferred Sandhill Dunnart habitat.

Malleefowl

The Malleefowl ***(Leipoa ocellata)*** is listed as Vulnerable under the EPBC and Wildlife Conservation Acts) but little is known of its distribution in the Great Victoria Desert. Its preferred habitat is thought to be dense vegetation, typically dense thickets of long unburnt Mulga shrubland. Targeted searches (long walks) were carried out during the day in September and October 2018. Overall, four birds were observed, five inactive nesting mounds were recorded and Malleefowl tracks were sighted in several locations.

Flora

Two DBCA Priority flora were recorded during the survey.

The Victoria Desert Smokebush (Conospermum toddii) - Priority 4 and Eucalyptus pimpiniana - Priority 3.

Information for this article was taken from 'Great Victoria Desert Targeted Sandhill Dunnart and Malleefowl Survey 2018' by Greening Australia. A copy of the report is on the GVDBT website. For further information on the project, contact Blair Parsons at Greening Australia, BParsons@greeningaustralia.org.au or Joe Meadham, jmeadham@greeningaustralia.org.au

Photos from left top to right bottom: 1. Honey-suckle grevillea (Grevillea juncifolia) 2. Grevillea secunda. 3. Southern cypress pine or marro (Callitris preissii) 4. Victoria Desert Smokebush (Conospermum toddii).

Fire meeting

In November 2018 the Trust facilitated a highly interactive and informative meeting on Indigenous fire practices and the steps necessary to increase traditional fire practices and protect cultural assets in the Great Victoria Desert.

The meeting was attended by representatives from Yilka, Spinifex Rangers, the Department of Biodiversity and Conservation (Regional Fire Officer, Fire Ecologist and Fire scar mapping expert), Rangelands NRM and Ten Deserts.

Each of the groups at the meeting brought with them a unique set of knowledge about fire and its interaction in the landscape. The Trust was overwhelmed by everyone's willingness to share their knowledge and experiences and to try and work together to achieve positive outcomes for biodiversity and cultural assets in the Great Victoria Desert.

On-ground fire management will always be challenging but working together utilises the strengths of both scientific and traditional knowledge of fire. The Trust will be attending the Southern Deserts Ranger Forum in late July 2019 where fire training is being conducted with Ranger groups across the Southern Desert region.

Spinifex burning. *Photo: Neil Burrows.*

Photo taken from motion sensor camera during the 2017 Trust funded Greening Australia survey.

Meet the new Acting Operations Manager

In August 2019 Dr Dorian Moro will be taking over as the new Acting Operations Manager position as the current Operations Manager, Kathryn Sinclair, commences maternity leave.

We're really excited to have Dorian on board to cover the role. Dorian brings with him a wealth of experience, with over 20 years experience across the mining sector, government and academic agencies.

Dorian has worked on science and landscape projects across the Pilbara and offshore islands facilitating the conservation of threatened species, and brings both an understanding of the need for strategic thinking and on-ground management

Dorian commences with the Trust on the 5th of August, please feel free to get in touch on operations.manager@gvdbiodiversitytrust.org.au.

Dr Dorian Moro.

Yilka Country

Article by Bridie Hardy, Yilka Heritage and Landcare

Yilka country comprises of an area of approximately 12,260 square kilometres to the northeast of Laverton in Western Australia on the edge of the Great Victoria Desert. Yilka country is predominately Aboriginal Reserve land, but also encompasses the Yamarna Pastoral Lease, with the Aboriginal community of Cosmo Newberry located on Yilka country.

Yilka country. Photo taken by Mladen Mrvelj.

On the 27 September 2017, the Yilka people had exclusive native title rights and interests recognised on country at Yilurn, an important cultural site. Since the native title determination, Yilka have been in the process of building a ranger program which will provide greater employment opportunities to Yilka people. The ranger team will allow the group to maintain cultural heritage, knowledge and practices and will contribute to the environmental management of country with priority areas such as Kapi, water; Waru, fire; threatened species and biodiversity protection; and feral animal management identified.

Drone footage of Yilka country taken on a heritage survey. Photo by Mladen Mrvelj.

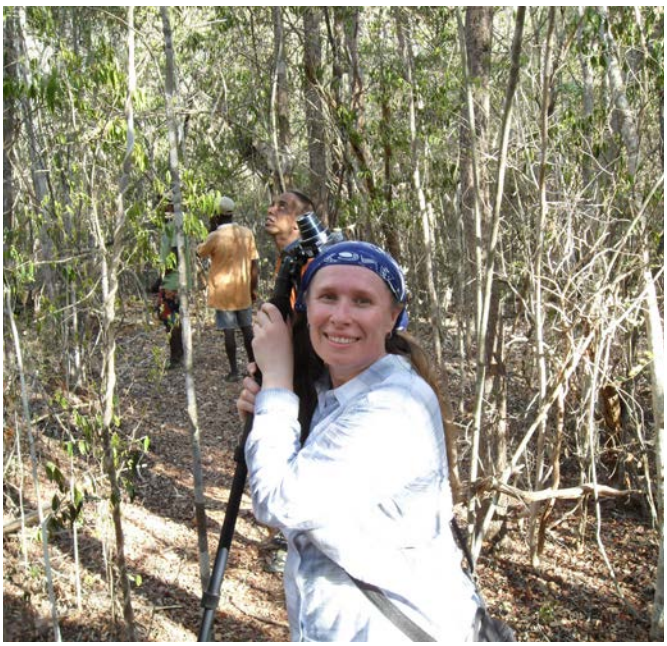
Yilka has been collaborating with partners to develop strong land management plans which incorporate traditional land care and management. In October 2018 Yilka rangers, assisted by Kealley Consulting, undertook field work to develop a sandalwood sustainability management plan. In April 2019 Yilka rangers, assisted by Integrate Sustainability Pty Ltd, undertook field work to identify priority areas of Yilka country which will be the foundation of Yilka's land management plan. Yilka have also been working closely with Gruyere Gold Mine undertaking heritage surveys to ensure cultural sites and country are protected.

Yilka look forward to working collaboratively with the Great Victoria Desert Biodiversity Trust and will be involved in ground-truthing results from the Malleefowl LIDAR survey later in 2019.

Please contact Bridie Hardy, Heritage, Land Care and Special Projects Officer, Yilka Heritage and Land Care Pty Ltd at bridiehardy@yilka.org.au for further information.

Maku (witchetty grub). Photo by Mladen Mrvelj.

Meet a Technical Advisory Panel Member - Belinda Bastow



Belinda Bastow

- **When & why did you join GVDBT Technical Advisory Panel (TAP)?**

I joined the TAP in 2014 when the TAP was established. I wanted to remain involved in the trust once I left working at the Tropicana Gold Mine. The Trust was an idea we developed and put forward during the approvals of the Tropicana Gold Mine.

- **What's your background/ qualifications / employment history? When & why did you join GVDBT Technical Advisory Panel (TAP)?**

I am an Environmental Scientist with over 20 years working in or supporting the Resources Sector.

I have an BSc (Environmental Biology) Honours, Post Grad in Impact Assessment and Masters in Environmental Law. My environmental career commenced in 1996 at the Boddington Bauxite Mine as an Environmental Research Officer. Between 2001 and 2005, I worked at Sunrise Dam Gold Mine. From 2007 until 2014 I worked within the project team that undertook the baseline surveys and undertook the approval for the Tropicana Gold Mine.

In 2014 I established Integrate Sustainability, a bespoke consultancy working with exploration, smaller miners and community groups.

- **Any quirky interest or interesting facts about yourself?**

My dream house is a house inside a hill like at Hobbiton.

- **Any advice you'd give people or things you've learnt?**

I believe to be successful in life and career we must pay forward.

- **What's your interest in the GVD?**

After spending over 7 years working in the GVD I have a soft spot for the region.

- **What's your contribution/role to the Technical Advisory Panel?**

My contributions to the TAP is to provide technical and practical advice on proposed research priorities, field work and an independent view on proposed activities.

- **Highlight of being part of the GVDBT.**

Seeing the identification of new Sandhill Dunnart populations in WA.

Presentations and Workshop on the Sandhill Dunnart

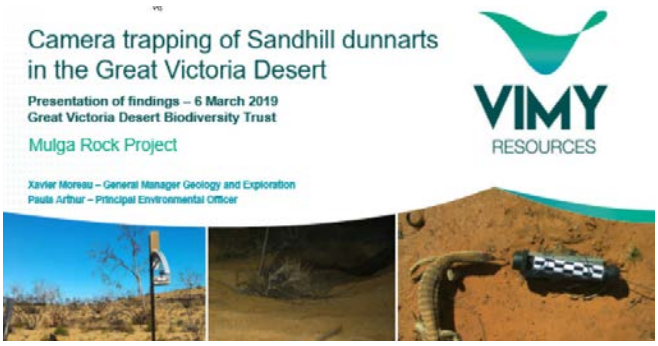
On the 6th March 2019 the Trust facilitated a series of presentations on the latest research on Sandhill Dunnarts. There has been significant research on this elusive little critter since the Trust held a workshop in 2014. Over 30 people attended the workshop to hear about the newest discoveries in detecting this threatened species.

Participants who took part in a series of presentations on the latest research on Sandhill Dunnarts.

There were three presentations:

Greening Australia presented on the results of their recent pitfall trapping trip to the GVD (funded by the Trust). Three individuals (2 females, 1 male) were captured via pitfall trapping (0.4% trap success).

Vimy Resources presented on 'Camera trapping of Sandhill dunnarts in the Great Victoria Desert' and described the unique camera set up they've established for maximising the detection of Sandhill Dunnarts. With thousands of hours of camera trapping data, Vimy have been able to determine not only the optimal camera and baiting set up but also detect changes in the frequency of Sandhill Dunnart detection throughout the year.



The Vimy Resources presentationj.

Jeff Turpin and Jo Riley provided a presentation on the survey work and research they've conducted in the GVD in connection to Jo's PhD. This includes a range of completely novel research on:

- Radio and GPS tracking
- Habitat use
- Shelters
- Diet
- Species distribution modelling
- Climate change

Jeff Turpin and Jo Riley's presentation.

The Trust would like to give a big thank you to the presenters for sharing their time and expertise with the participants. It was a fantastic learning experience for all who attended.

The presentations were followed by a workshop to discuss the major threats facing the species and what actions should and could be taken to mitigate these threats. A range of experts attended the workshop and were able to set tangible projects that would benefit the conservation of Sandhill Dunnarts. Many of these projects are currently underway or being scoped including the development of Fire and Feral Management area focussing on areas of Sandhill Dunnart occupancy.

The Trust would like to thank everyone who attended the presentations and the workshop, for sharing their knowledge and expertise. For more information and to see a copy of the presentations please visit the Trust's website: www.gvdbiodiversitytrust.org.au.

Contact the Trust

If you have any GVD research, updates or stories, please forward them to the Trust to share with key stakeholders via the Trust's website and newsletters. Thank you to everyone who has contributed so far. If you would like to donate to, or partner with the Trust, please contact the Trust's Operations Manager on 0407 143 893 or operations.manager@gvdbiodiversitytrust.org.au