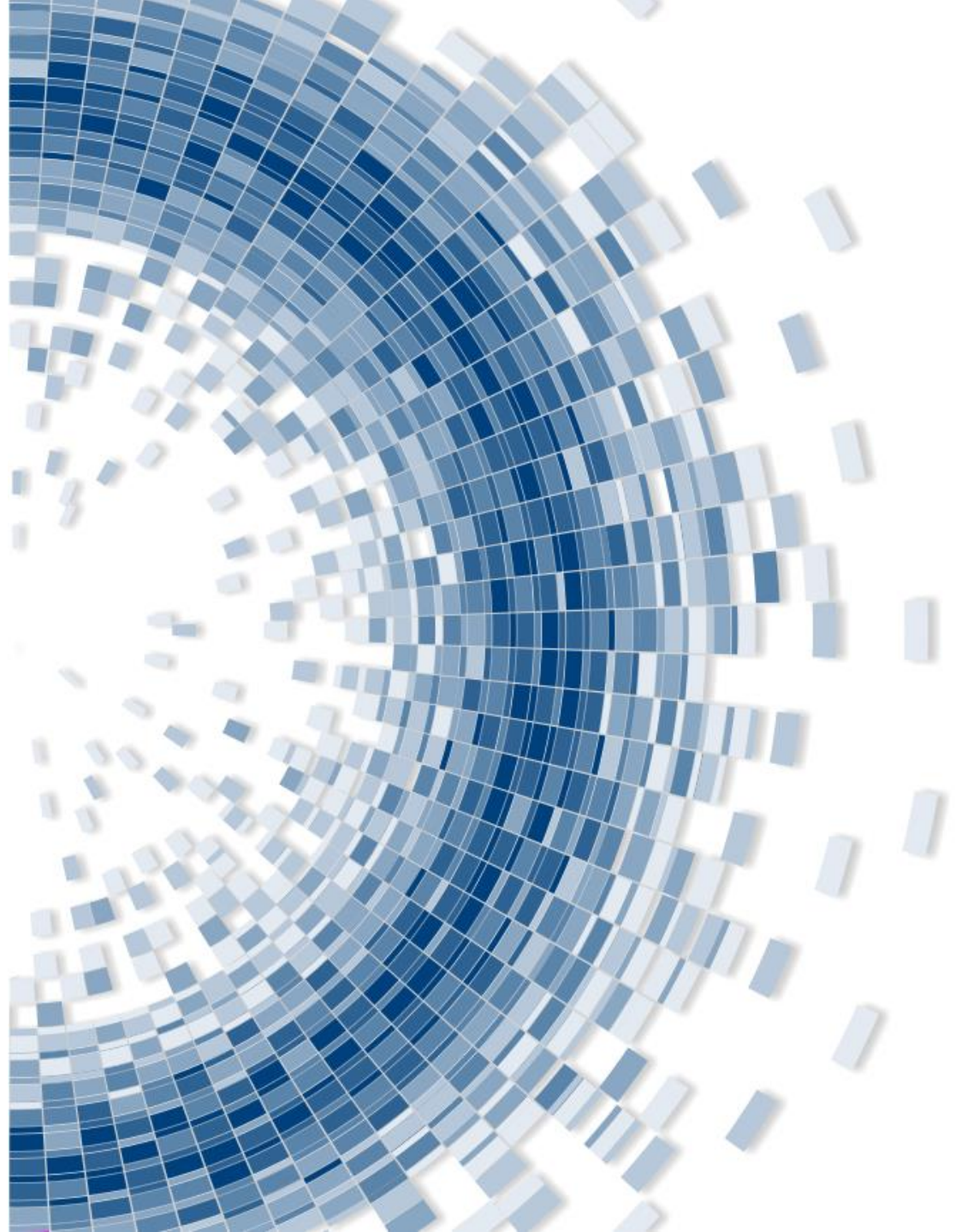
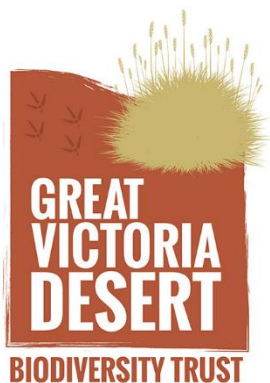




Great Victoria Desert Malleefowl Survey

Great Victoria Desert Biodiversity
Trust and AngloGold Ashanti
Australia Limited



- Anditi and MNG
- Project Outline
- Aerial survey
- Data analysis
- Results
- Data reliability
- Conclusions

Anditi Pty Ltd is an Australian analytics company that develops software, algorithms and methodology to analyse data. The **Anditi Engine** - a data processing engine was developed by us to **efficiently process through massive chunks of data fast**. *Example: The point cloud for GVD was 40GB*

Anditi has expertise in spatial data collection and processing, data science and analytics, and data delivery via 2D and 3D web portals

Anditi head office is in Newcastle NSW with a satellite office in Perth WA.

Great Victoria Desert Location and size



Location: 700km ENE of Perth, WA and immediately East of Laverdon, WA.

Size: 600m wide corridors, 1675km long, 1000km²



Great Victoria Desert

LIDAR SURVEY FOR MALLEEFOWL DETECTION

MNG ALS System

Riegl Laser Scanner – 300,000 pt/sec. Multi-returns.
Survey grade GNSS and IMU.
Nikon 36MP camera.

Cessna 182 – Oberon Aviation



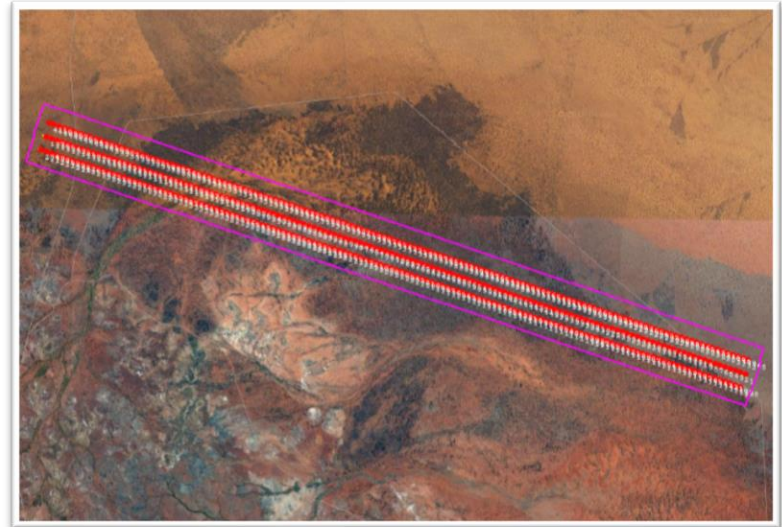
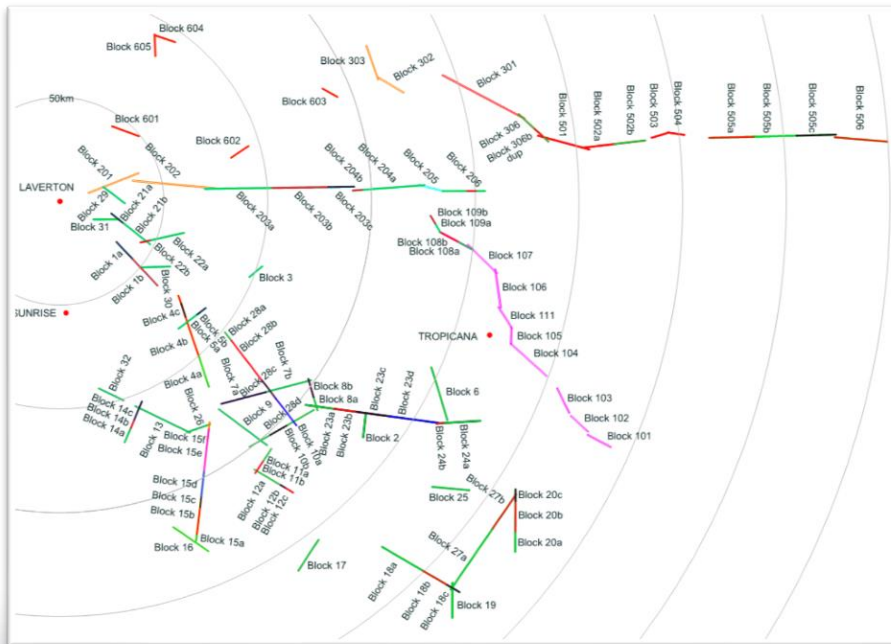
Project Acquisition

Mobilised to Laverton January 2019.

Flight Plan – 900ft AGL, 80kn.

Revised - 800ft AGL, 100kn.

3 x runs per corridor.



1650km of corridor to survey
Over 1000 km² of capture.
+450 x 5km tiles of LAS files
consisting of +9 billion LiDAR points.
74,000 images captured at 6 cm
Ground Sampling Distance.

Project Processing

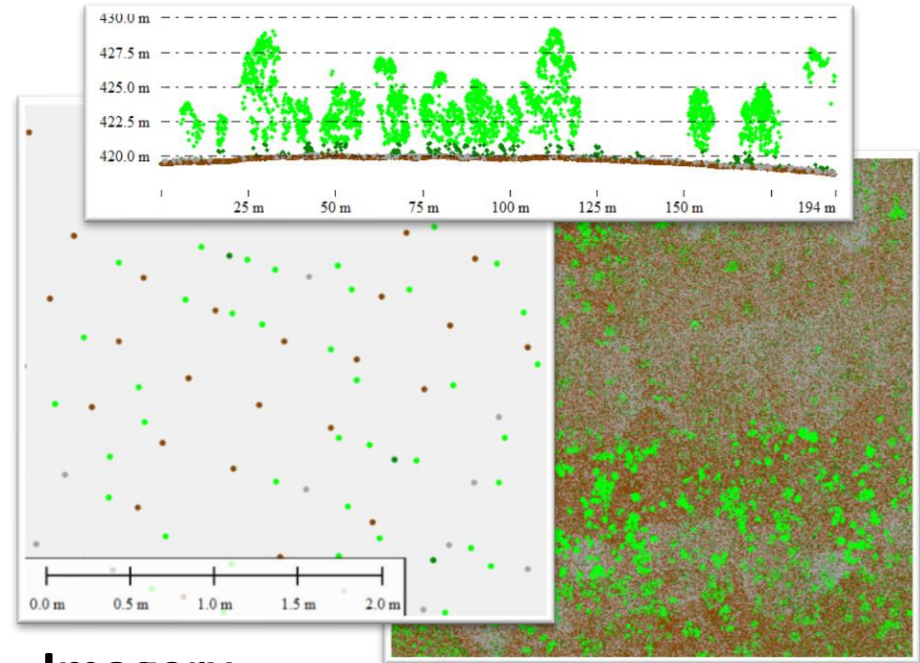
LiDAR

Trajectory data

Point cloud generation

Corrections for flight fluctuations

Classification & tiling



Imagery

Photo centres coupled with images.

Triangulation, photo point cloud, DEM.

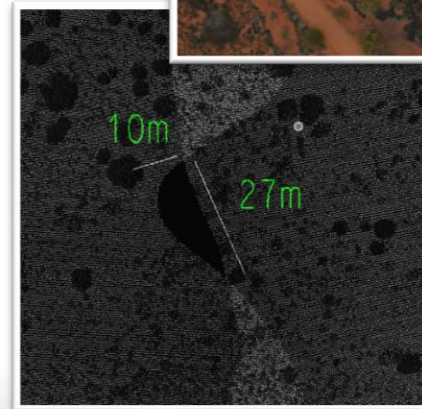
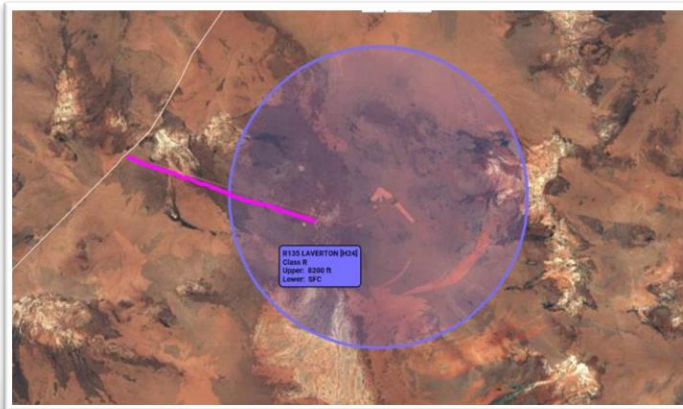
True ortho-photo mosaic.

Result - 19 Mosaics

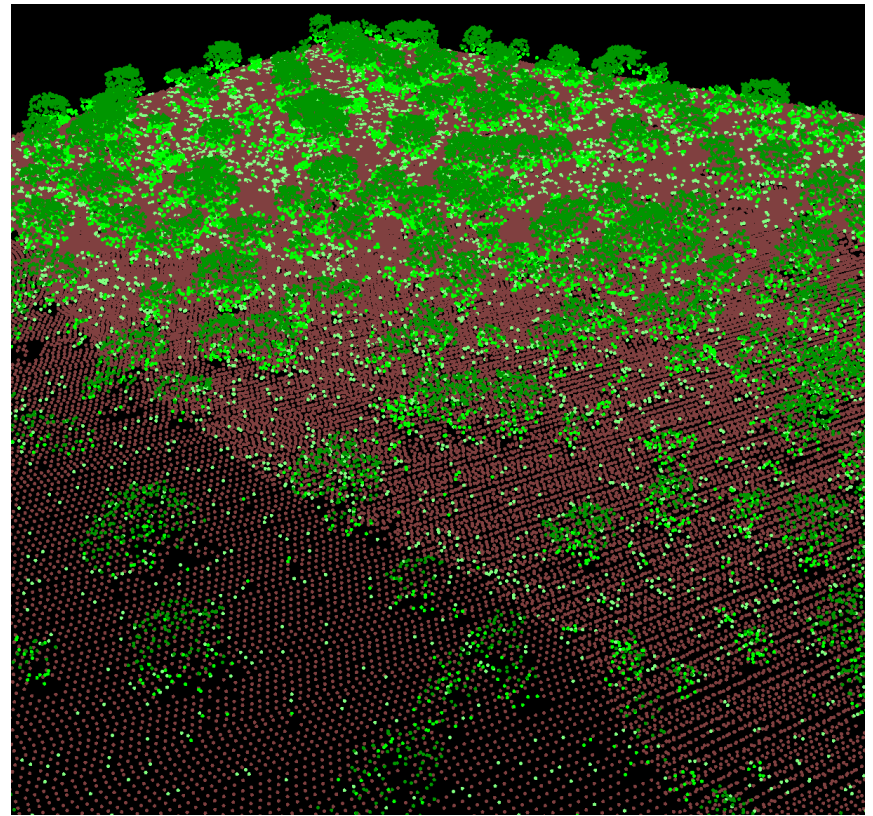
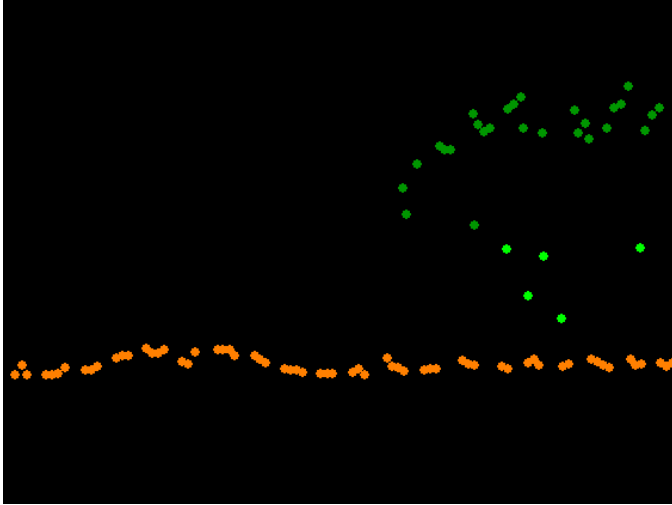


Project Issues

- Revised acquisition – reduced overlap / coverage.
- Environmental – Heat, wind, storms, fire.
- Restricted airspace - Defence SA.
- Long corridors – fatigue, imagery.
- IMU gaps.
- Processing lag time.
- Imagery colour balancing.



Point cloud classification



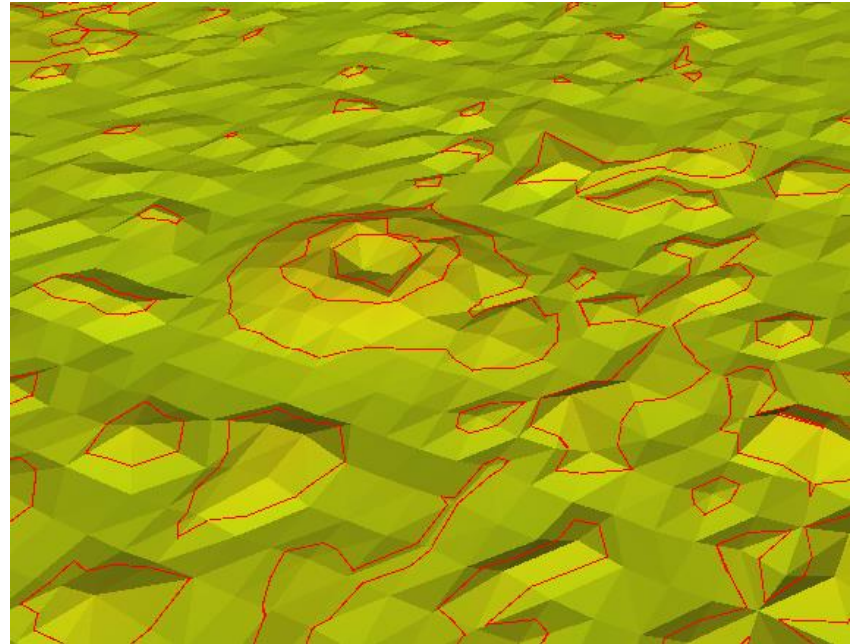
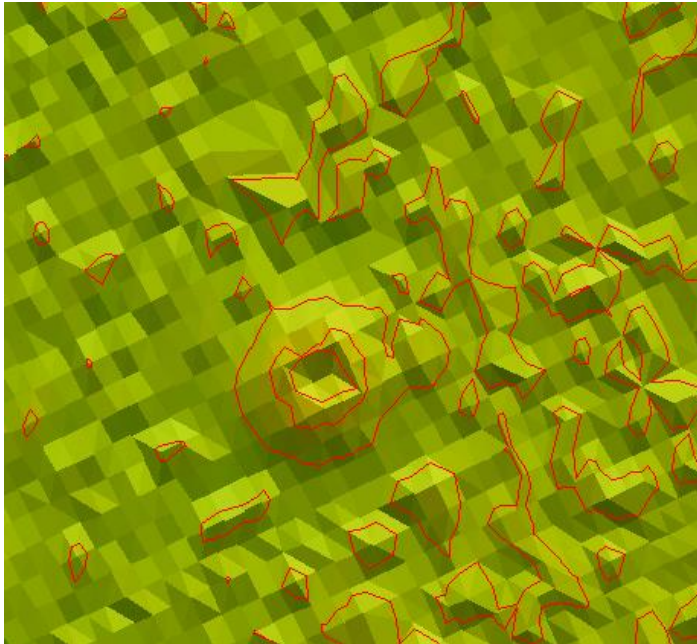
Classification is done twice:

- Once at 55° for the Malleefowl analysis search
- Once at 36° for classification to ground and non-ground.

Analysis is automated

The Anditi Malleefowl mound algorithm searches for ground features that are mound shaped and then categorises them by how close to an ideal Malleefowl mound shape they are.

1 is very close to 4 being mound shaped and sized but not very similar overall



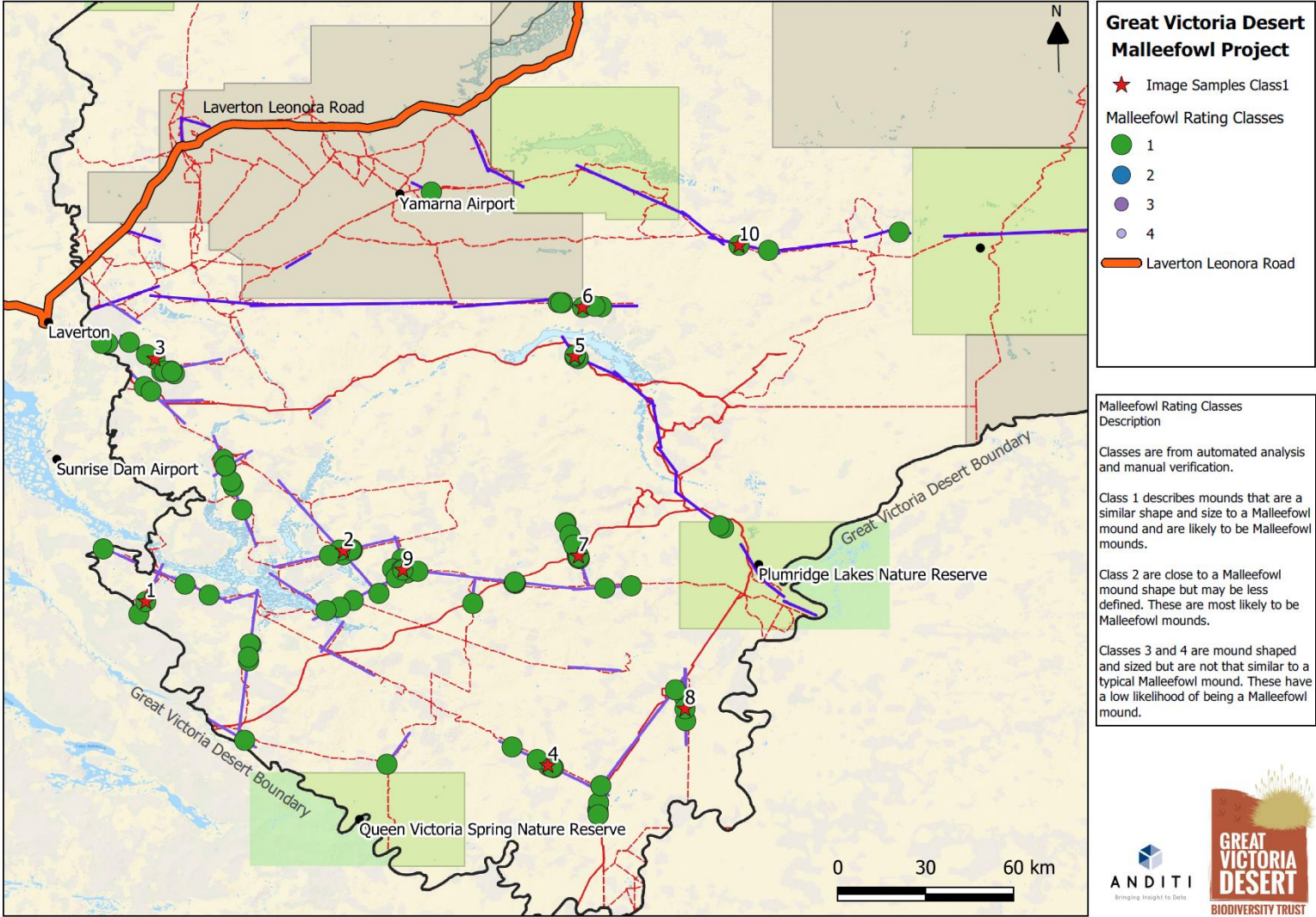
Data checking

Anditi staff manually check class 1 and 2 mounds in the point cloud to visually confirm that the algorithm is performing correctly.

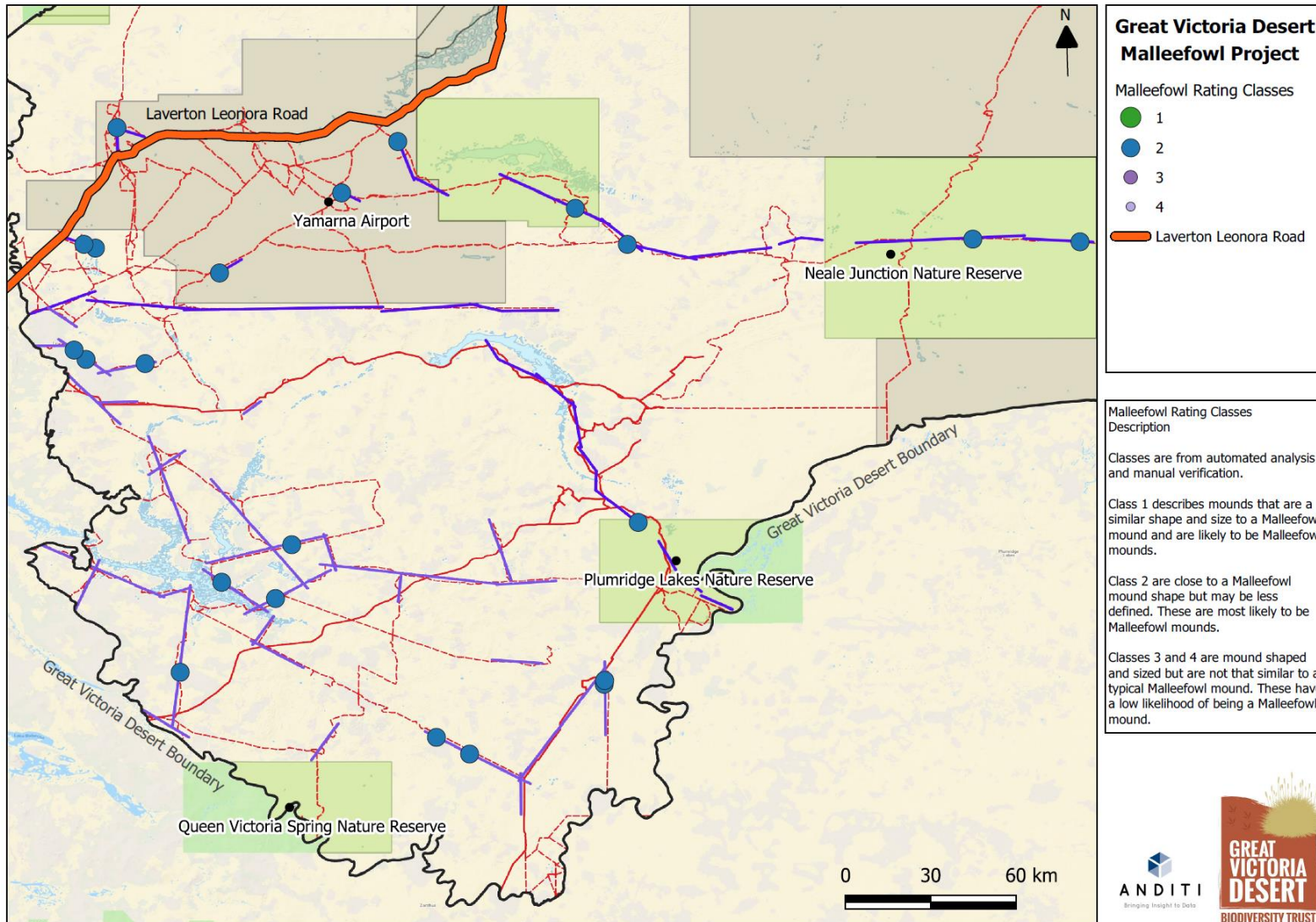
If/Once the orthophoto is available further visual checks are done



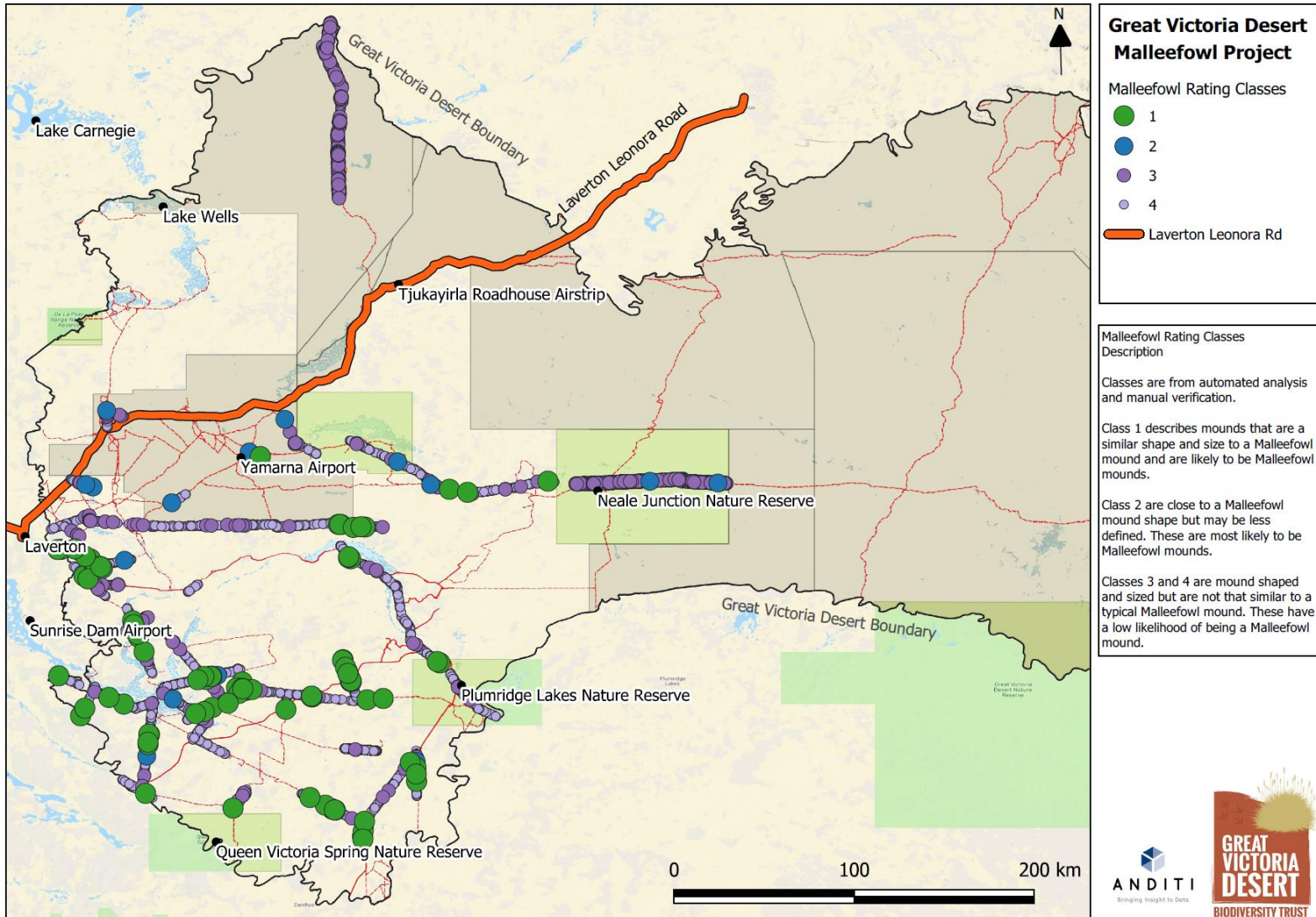
103 Class 1 mounds



22 Class 2 mounds



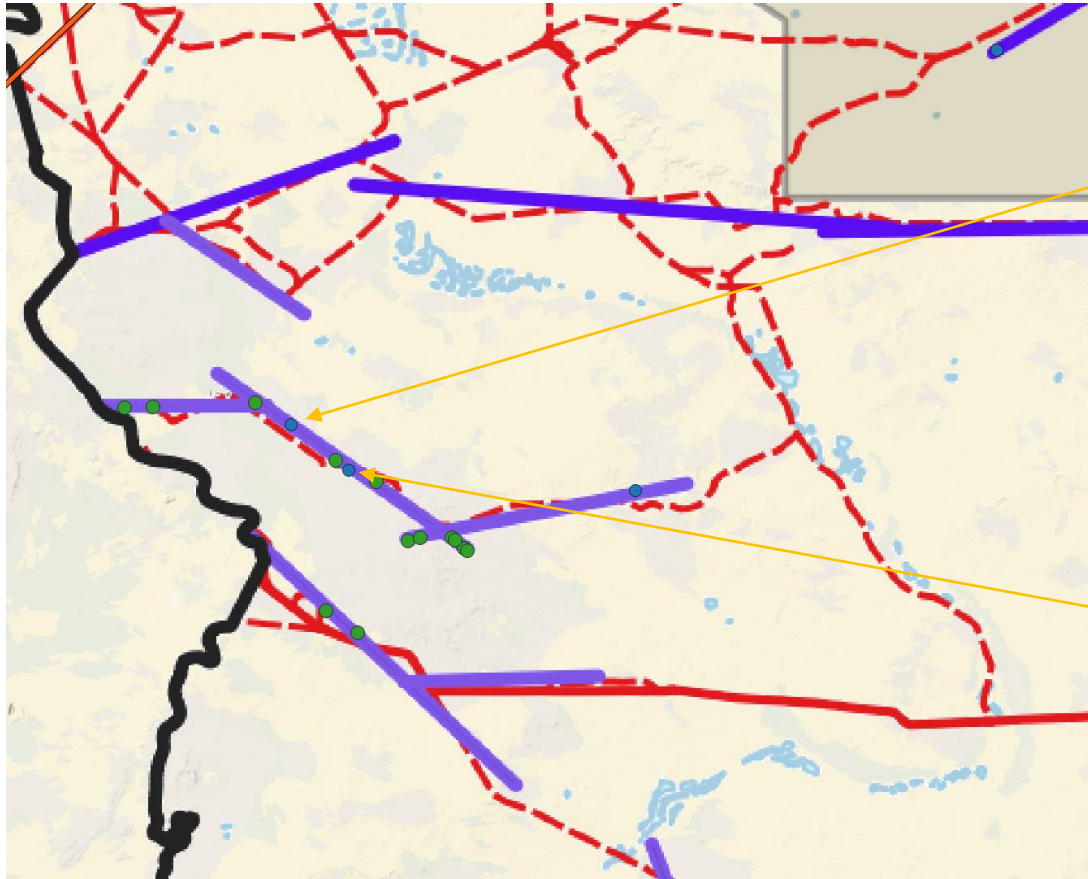
1826 Class 3 mounds and 21,713 Class 4 mounds



Class 1 mounds



Class 2 mounds



Class 3/4 mounds



The class 1 - 4 mound-like features are not Malleefowl mounds, they just represent the closest matches to what a Malleefowl mound might look like in a LIDAR point cloud.

The orthophoto is a great resource for determining what the mound is if exposed from above.

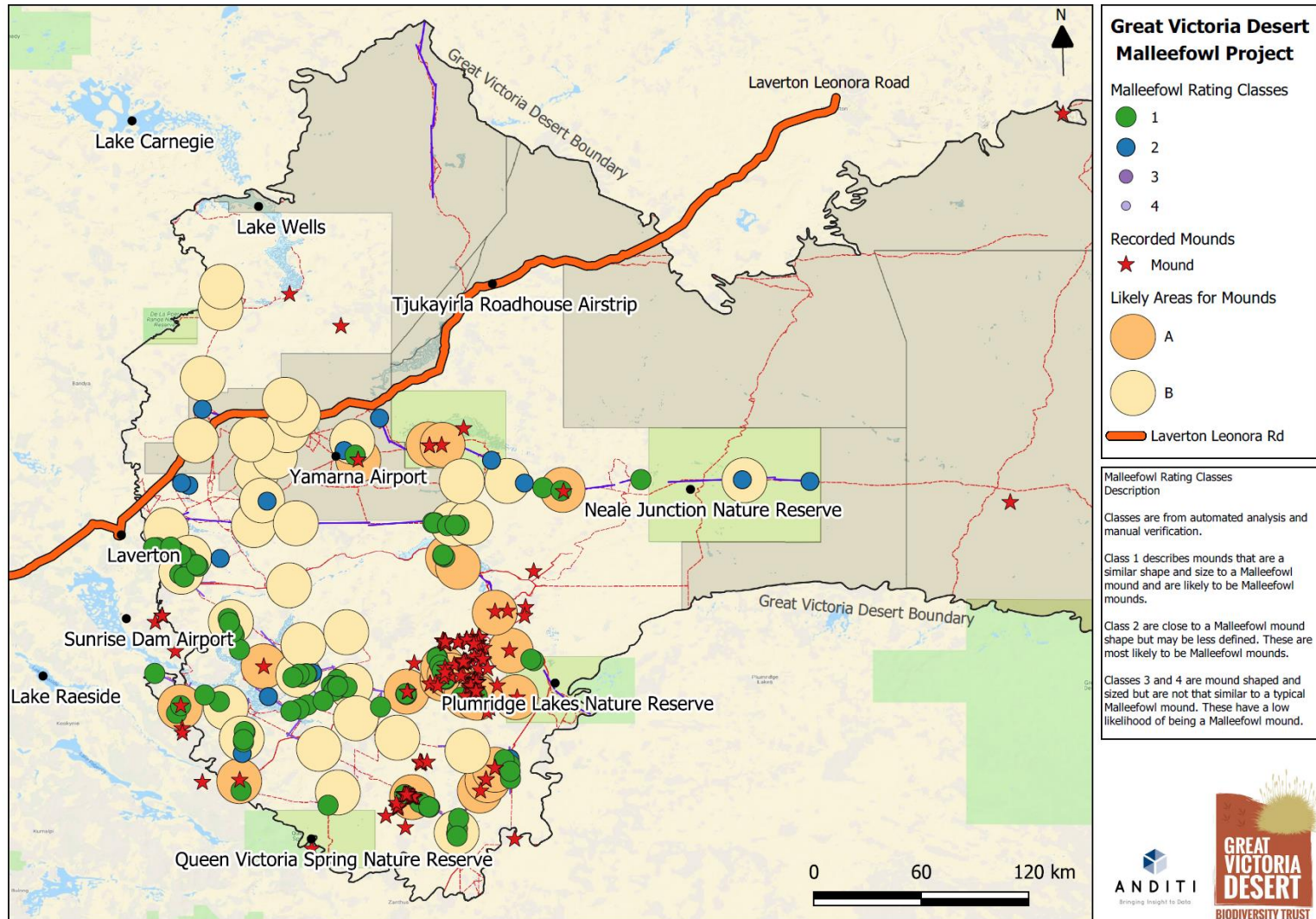
- Class 1 are very likely to be Malleefowl mounds**
- Class 2 are possibly Malleefowl mounds**
- Class 3 is unlikely to be a recent Malleefowl mound**
- Class 4 is a mound of earth, rock or similar that is approximately of the same dimensions as a Malleefowl mound**

Classes 1 and 2 are visually checked. This does not confirm they are Malleefowl mounds, only that they could be and are not obviously something else. They are all worth rating for field checking.

Classes 3 and 4 are not checked. They could be discarded however they can also form part of a further project where students/volunteers could rate them for future fieldwork. Some partially obscured, old or damaged mounds do end up in these classes.

Our software reliably finds mounds. Some are very like Malleefowl mounds and some are just somewhat similar in size. The software and subsequent manual checking rates these by how closely they are related to an ideal Malleefowl mound.

Known mounds and Areas likely to have Malleefowl?



Known mounds?

Using a government database of “known” mounds, there is little evidence of any feature in the orthophoto at these locations. The locational accuracy is however unknown.



Most of the class 1 mounds look in the aerial orthophoto to be very good candidates to be Malleefowl mounds

Many of the class 2 mounds appear to be worth a field visit

Even some of the class 3 mounds could be checked if time and budget allows

This project has the potential to further expand knowledge of Malleefowl locations and habitat in the Great Victoria Desert area. It clearly shows that the northern section is unlikely habitat for Malleefowl

When compared to existing data and methodology, this project has rapidly mapped potential mounds across a wide area and provided data that can be used for habitat identification and targeted field trips



More pictures – Class 1 mounds



More pictures – Class 1 mounds



More pictures – Class 1 mounds