

NATIONAL
FERAL PIG
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Stakeholder forum: 13 December 2021 Response to questions

Q: Is there work being done on assessing the application of thermal sensor unmanned aerial vehicle (UAV) on monitoring feral pig numbers over wider and more inaccessible areas?

Comment:

Stuart Dawson (DPIRD) advised attendees (via the chat function) that DPIRD WA, and a range of partners in other states, are investigating the use of thermal imagery (both from a helicopter and a drone) to survey multiple species including feral pigs.

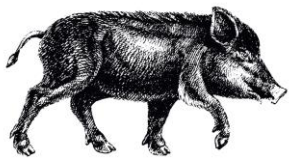
Chris Gaschk - Western Downs Regional Council have conducted a small trial to do pre and post control surveys using thermal imaging and UAV. The UAV platform has limited battery life so it is not possible to survey large areas to find pigs. It may be a useful technique where there are higher densities of feral pigs present, however our estimated density is 1.2 pigs/km². Using more commercial level UAVs that can fly beyond line of site for longer time periods may be useful, but it is important to consider issues including thermal interference e.g. from hot rocks. The use of image classification AI to classify the data set is being looked at, to assist with reducing costs of manual data entry for hours of thermal video footage.

Andrew Bengsen – Riverina Local Land Services, with help from NSW DPI, have been using helicopter-mounted thermal sensors for feral pig surveys over large areas. I don't know of anybody getting useful results with UAV-mounted sensors.

Q: I'm wondering about the app you use to collect information on baiting, trapping etc and what variables and information you collect? Also wondering how comparable different control methods and baits are?

A: Justin - Several apps are used to collect information about management. We use DistanceSampler (iPad) Distance Sampler on the App Store (apple.com) to collect data on aerial shooting and surveys. We sometimes use cyber tracker to collect data on baiting and trapping. We use GIS Pro or GIS Touch (iPad) to set up our own data collection sequences on iPad.

All control methods are context specific so they can be directly compared if you are wanting to contextualise the comparison based on the value you are trying to protect and also how each method is contributing to the outcome. For example, we would generally suggest that recreational hunting isn't very useful for managing feral pig populations. However, if you direct hunters to an area with a problem boar that is eating turtle nests and they hunt it out of dense scrub then the method is useful. When we have compared methods used to control feral pig populations for protecting sea turtle nests, we found that targeting baiting was the most successful compared with aerial culling and trapping. Our work suggested that all the methods have their place but were often not applied in a systematic way and were not targeting specific populations - so they weren't effective in the long term. As data was collected on each method, we were able to determine how much money and effort had been put into each method and see if the work had changed feral pig populations. This was the important adaptive process that enabled refinement of our plans.



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Q: Hi Chris, would it be possible for you to share a contact for eVorta to the group?

A: **Chris** - The best contact is Hamesh Shah - hamesh@evorta.com. We've found they are a good company to work with and are open to any ideas to improve their software platform to suit your needs.

Q: Chris & Justin - are you looking at Return on Investment/capital spent for individual activities & annual reductions on damage by feral animals?

A: **Chris** - In our region, we have done basic calculations using commodity prices, energy requirements of a pig (DSE), density of pigs and diet studies for feral pigs and came up with an estimated cost of \$121/pig/annum or \$0.72/ha/annum. This estimate is purely based on the consumption of vegetative matter and doesn't include other impacts such as disease transfer and predation of livestock etc. We would still like to improve on the method above as there is some heavy assumptions in that calculation method. We are investigating the use of satellite Normalised Distance Vegetative Index (NDVI) data to estimate impacts on cropping production.

Q: Was 50m height for the drone critical?

A: **Justin** - 50m height is a trade off for having enough detail to train a model to find waterbirds as small as ducks. If you aren't interested in fine scale detail required for object detection models and are only interested in coarse scale classification of habitat, then you can fly much higher (100m would be fine). We experimented with different heights to determine the parameters that enabled the most consistent predictions for habitat and water bird species at our sites. For work we are doing in Kakadu, where our focus is on broad scale weed management, we fly at 80m so that we can cover a larger area in a reasonable time frame (under 30 minutes).

Q: Would be interested in talking to you about 50m and comparison to cost of flying helicopters?

A: **Justin** - Using high resolution imagery is an option if you are only interested in annual assessment of changes in broad scale habitat variables and we use satellite imagery for some of our landscape scale assessments.

The use of helicopters is more inclusive and can lead to much better ongoing management as it focusses on the use of local people to complete the tasks. For example, whilst the habitat surveys are being done, observers also count cattle, pigs and horses and this provides valuable species distribution data and enables land managers to better understand the distribution of animals and ecological limits that are driving the system. Additionally, helicopters are used for conducting aerial control operations, mustering and fire management so there is often limited extra cost to achieve the goals. I expect long range drones will become more important for many of these tasks soon which will increase the frequency in which data can be collected which will be very useful for adaptive management.

I think high resolution imagery could form a larger part of future solutions if it becomes more readily accessible through international platforms such as Microsoft's Planetary computer and is embedded within automated software solutions. This will mean that processing of data will not require specialised spatial analysis skills.