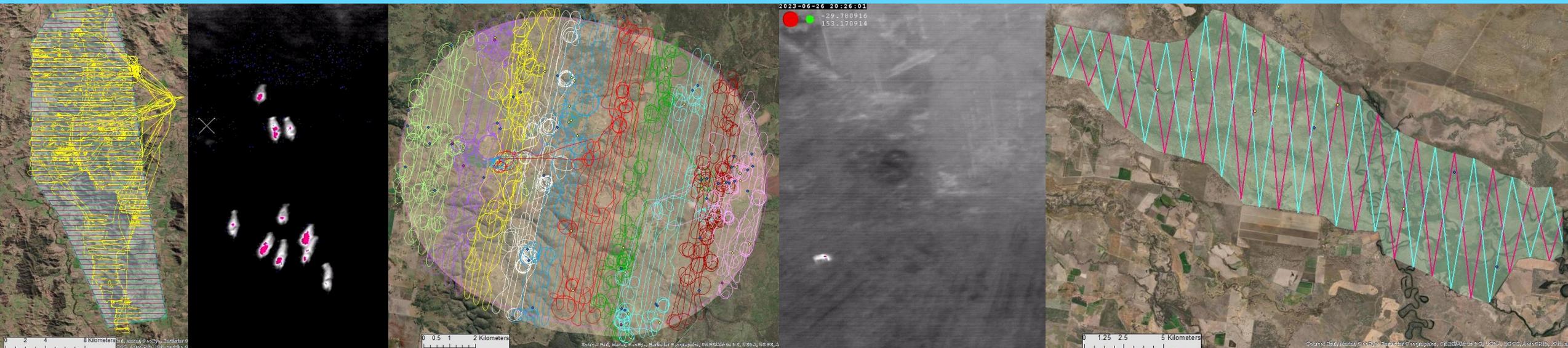


Why we want what we want

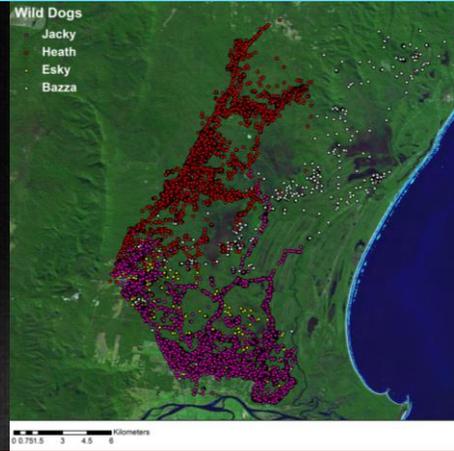
Working with researchers to collect appropriate data



October 2023

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Surveys- why do them?



Behaviour

Population estimation



Threatened species monitoring

Understanding impacts

What is your question?

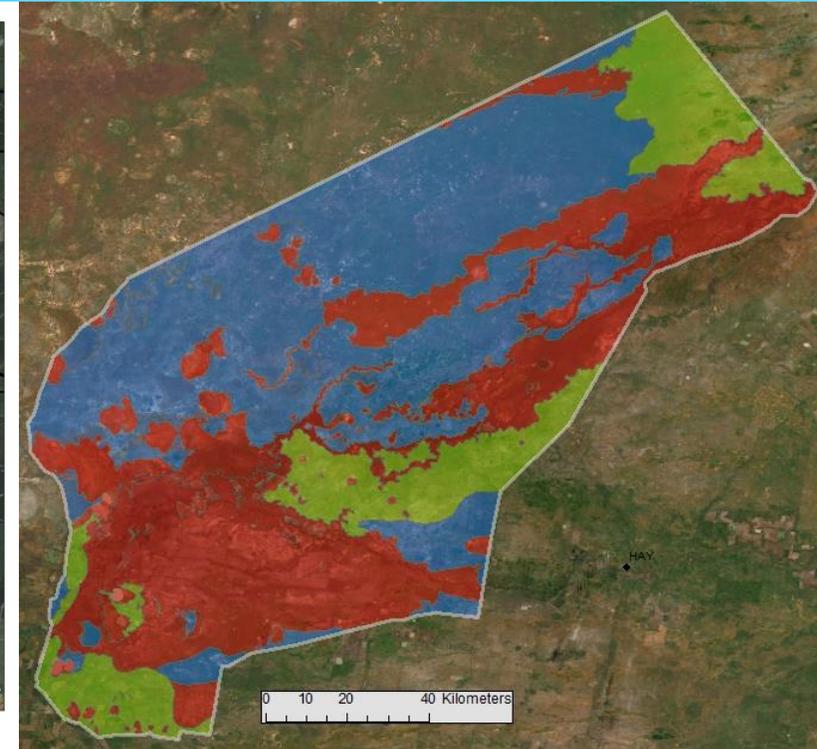
- What is the purpose?
- What do you want to get out of it?
- Is precision important or a general idea ok?
- What data needs to be collected?

This is where we can help!



How to collect the data?

- Method used
 - Depends on your question/s
 - How big is your site?
 - Budget/labour



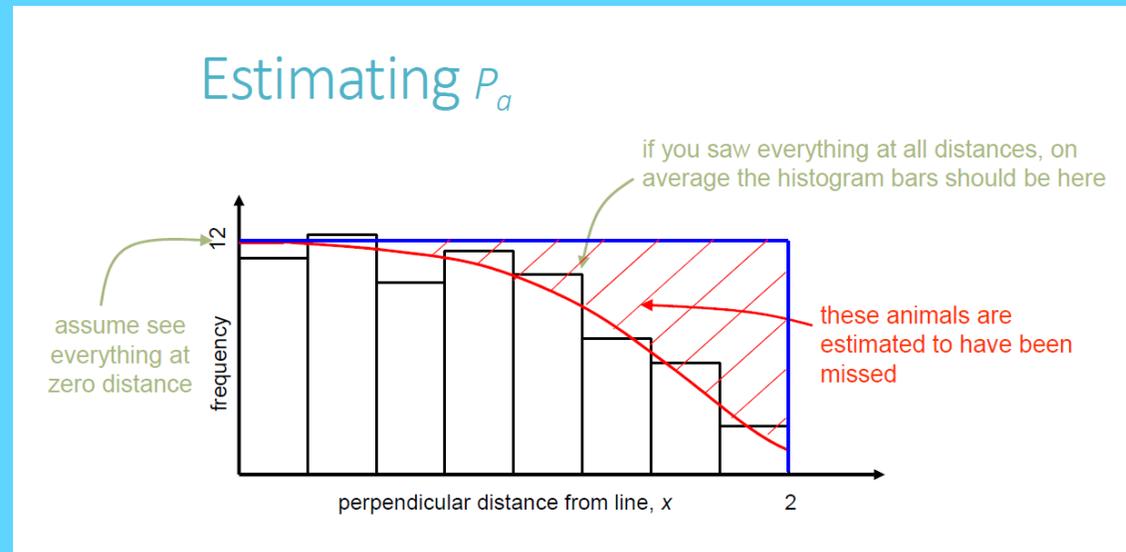
Aerial Surveys as an example

1. Species targeted
2. Why do the survey
 - Population estimate
 - Effectiveness of control
 - Comparison of survey techniques
3. Survey area
 - Large enough
 - Frequency



Aerial Surveys – Data analysis

- Distance Sampling
 - Estimate number of animals in an area
 - Use measured distance of individuals (or groups) to the transect line
 - Rate in fall of detections is used to determine the detection function
 - How many animals the observer has missed
 - More detections means more accurate estimates of the detection function



Aerial Surveys – Methods

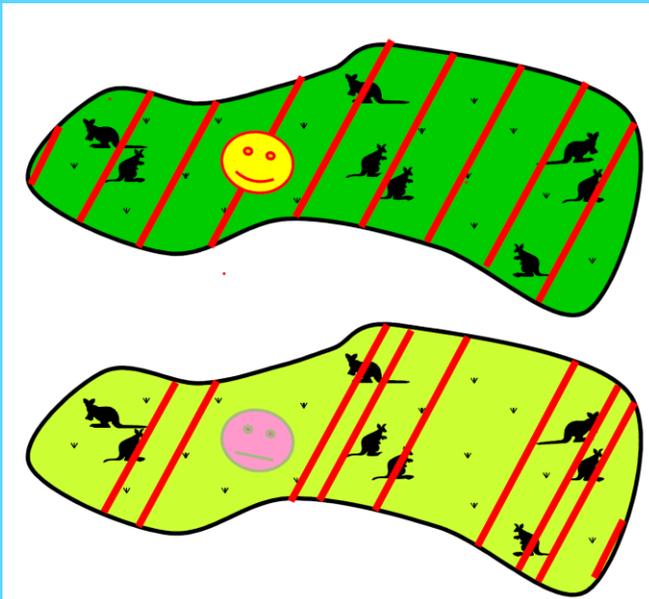
- Timeframe for results
- What technique?
 - Helicopter vs fixed wing vs drone
 - Thermal or visual
- Suitability of equipment
 - Habitat
 - Voice recording vs Xbox controller
 - Camera position



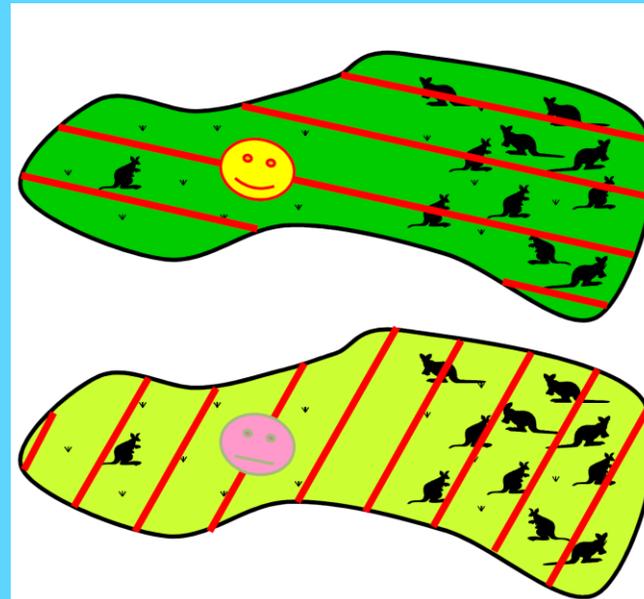
Aerial Surveys – Transect Lines

- >12 transects
- >60 detections for each species
- If expected small number of detections, then need more effort

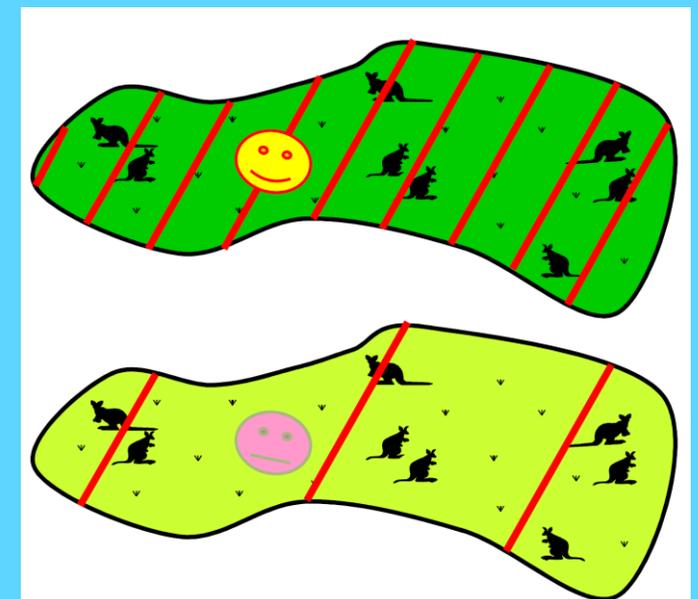
Systematic placement



Density Gradients

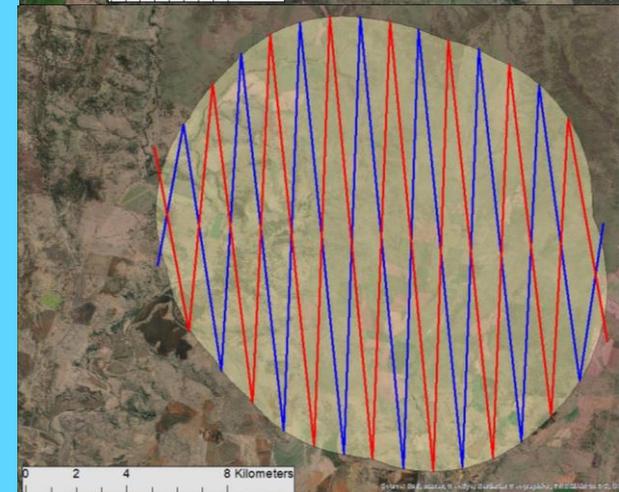
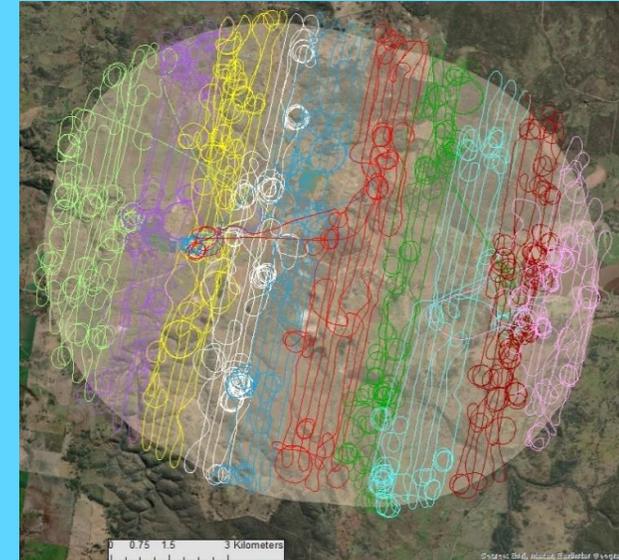


Enough



Aerial Surveys – Data collection

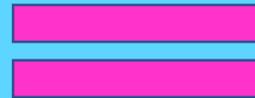
- Height above ground level
 - Must be constant
 - Swath width
- Speed
 - Should be suitable
- Flight path
 - Transect number
 - Transect length
 - Location
- Observer
 - Observer number
 - If more than one, location of observer in aircraft
 - Recommend two on same side of aircraft
- Target species sighted
 - Species
 - Number in group
 - GPS location when first seen
 - Distance from transect when first seen



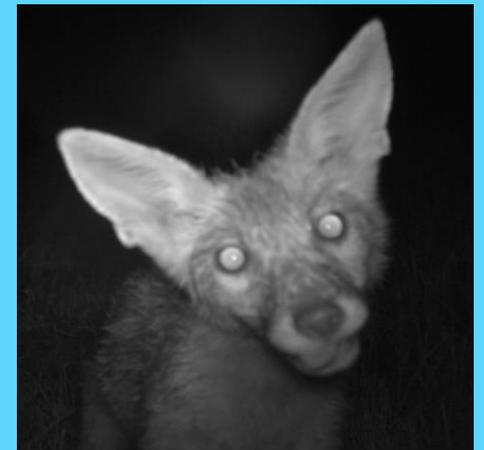
Aerial Surveys – What data will I get?

- Tracklogs
 - Transect number
 - Length
 - Video footage
- Height above ground
- Observer
- Detections
 - Species
 - Number in group
 - Transect line detected on
 - GPS location
 - Distance from transect line

Detection function

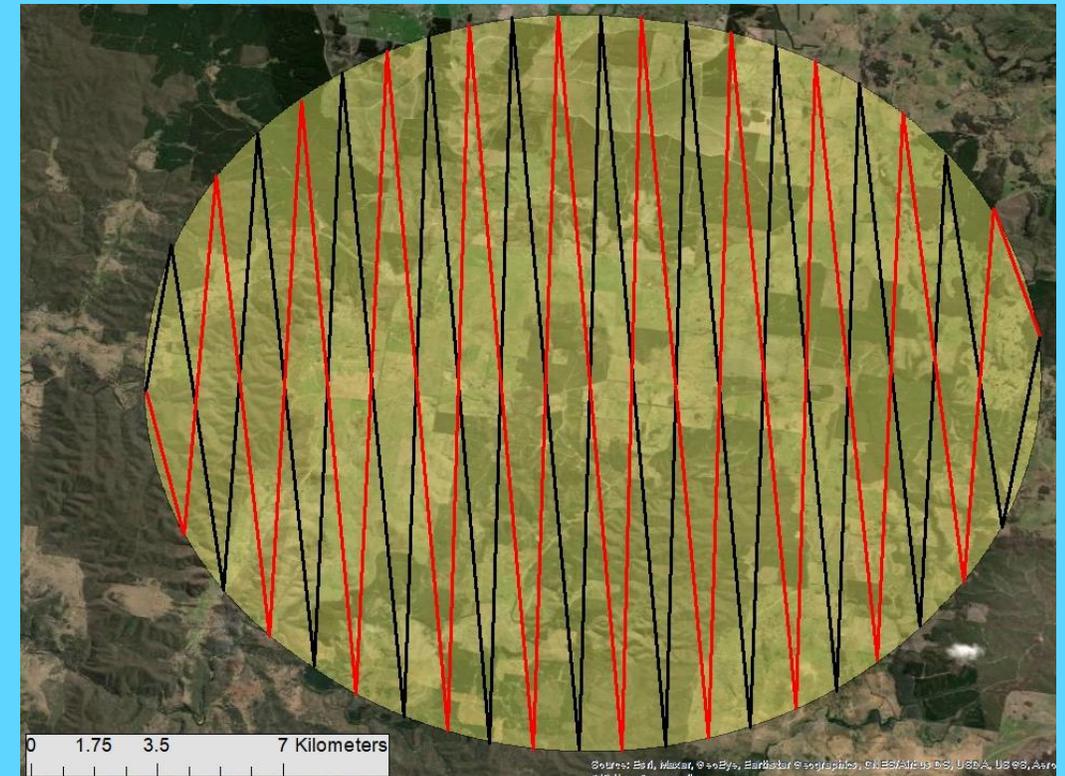


- Estimate density
- Estimate abundance
- Confidence in estimate
 - CV
 - SE



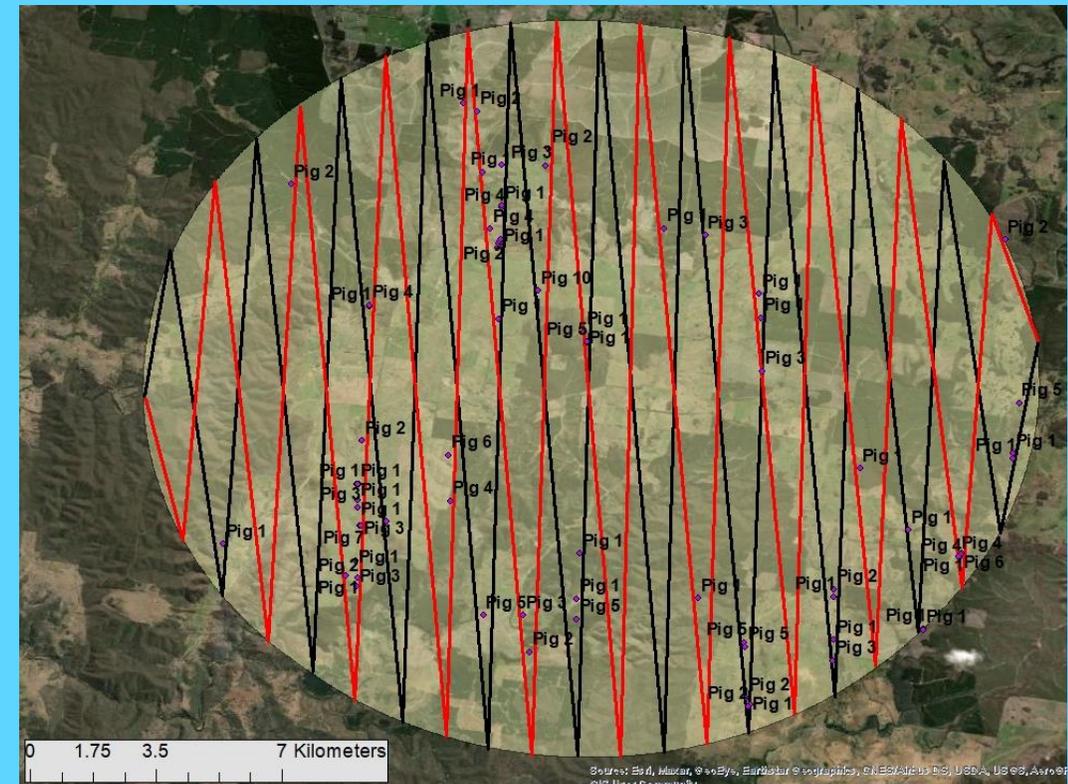
Aerial Survey Example – Burranga FMD

- Why?
 - Effectiveness of aerial shoot for FMD preparedness
- Survey area: 336km²
- Technique: Helicopter thermal
- Transects: 42 (671km transect length)
- Height AGL: 220ft
- Speed: 30-45 knots
- Swath width: 105.7m
- Area surveyed: 70.9km²



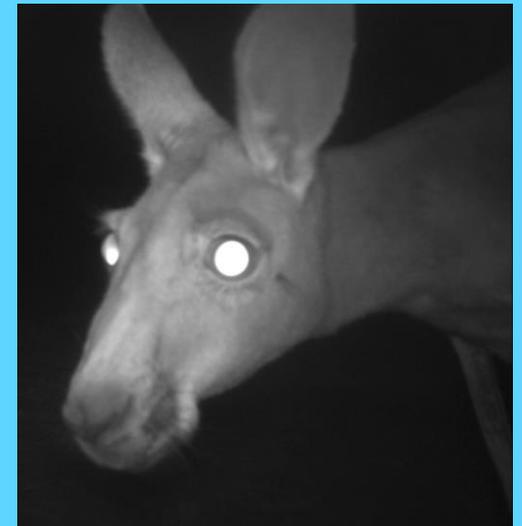
Aerial Survey Example – Burranga FMD

- Pre-control survey:
 - 71 detections
 - 167 individual feral pigs
 - Group size: 1-10
 - Abundance: 832 ± 195
 - Density: 2.5 ± 0.6
 - CV=23%



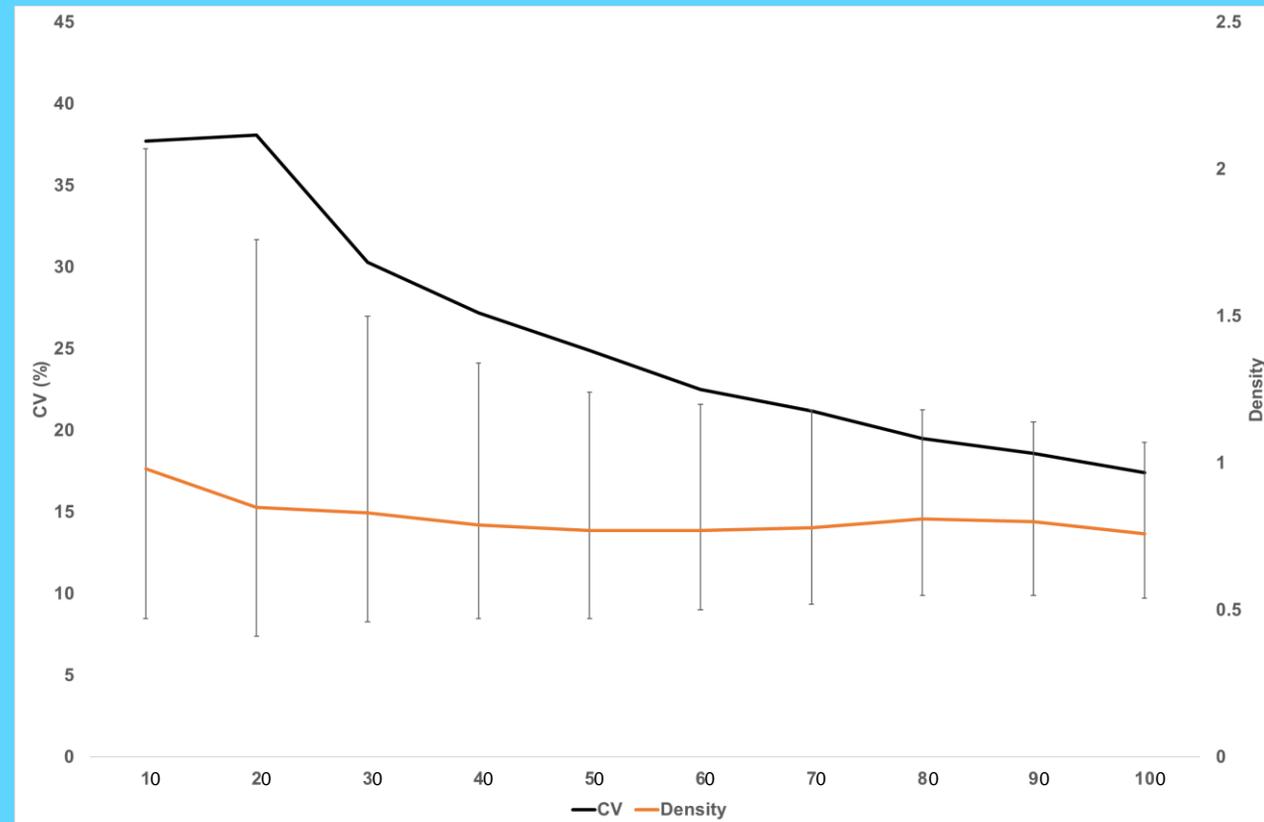
Aerial Survey Example – Burruga FMD

- How did CV ↓ with ↓ detections?
 - If methods are consistent we can combine survey data
 - Pre-control = 71 detections
 - Post-control = 44 detections
- Distance analysis using 115 detections
= ↓ CV and ↑ confidence in results



Aerial Surveys – Confidence in estimates

- How is CV affected by the number of detections?



What does this mean for you?

- Before engaging contractors
 - What do you want to achieve?
 - How to analyse data?
 - Survey area?
 - Available funds?
 - Continuity of surveys?
- Do the operators have
 - Sufficient skills
 - Method development
 - Data collection
 - Data analysis
 - Adequate technology
- Collect sufficient data
 - Survey area
 - Transects
 - Observers
 - Species
 - Number
 - GPS location
 - Distance from transect line



Confidence in Abundance
and Density estimates