



Department of
Primary Industries



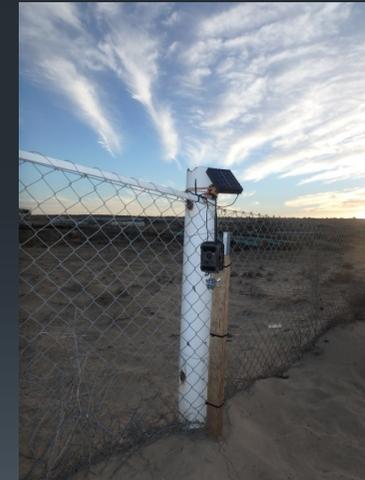
Putting some 'Snap' back in Traps: Technology Advances



Paul Meek, Guy Ballard, Heath Milne, Jaimen Williamson,
James Bishop, Greg Falzon, Simon Croft, Malcom Kennedy & Peter Fleming

Integrating Technology into Pest Control

- Integrating technology into existing tools is on the increase
- The objective is to make tools better “Bring Back the Snap”
 - PLEA: don’t disregard historical research/methods
- There are still issues to overcome with technology
 - e.g. Camera traps still not fit-for-purpose
- Automation is challenging and time consuming
- Components still need refinement to make them operational
- Work is needed on the interface between technology and practitioner



OLD PEOPLE



Y U NO UNDERSTAND TECHNOLOGY

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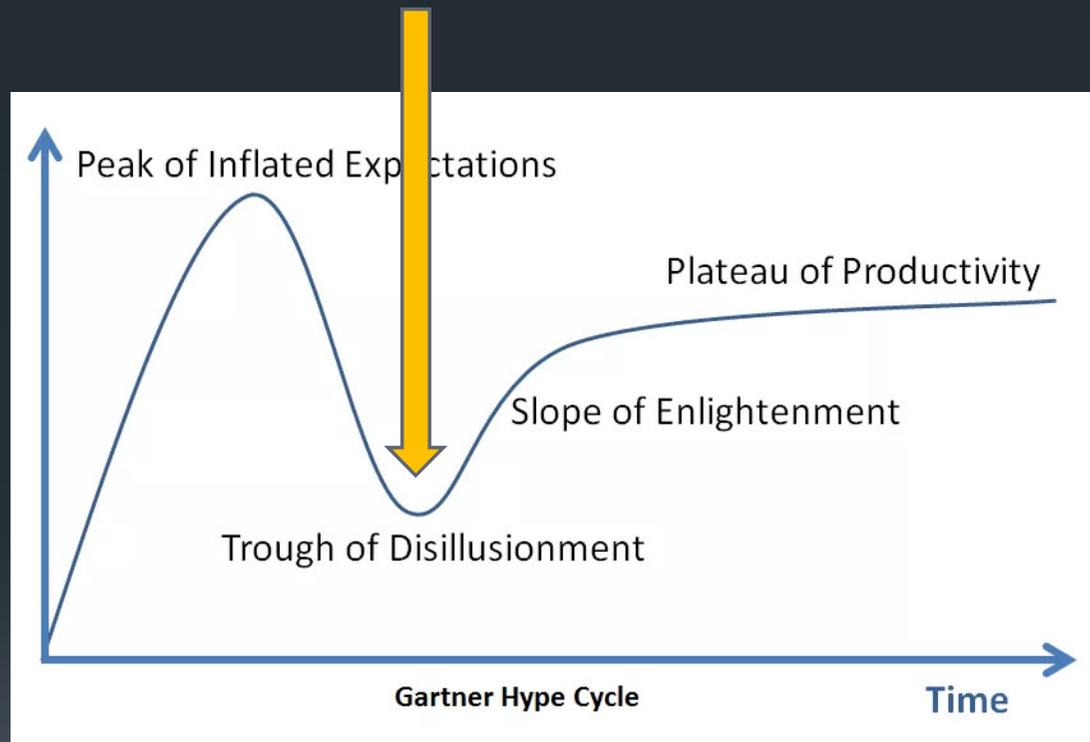


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Technical Impediments

- Camera trap image processing
 - Training and refinement of models for species and habitats
 - Time consuming and site specific
 - Images need to be tagged before they are useful
- Concept-R&D – market is a major constraint
 - How to power equipment for remote deployment
 - How to down size to make it useable
 - How to make it field viable ie dust and rain vs electrical components
 - IP and commercialisation ???????????????????
- FUNDING TO ENABLE US TO DO THIS WORK PROPERLY

Lots of time spent in the Trough of Disillusionment



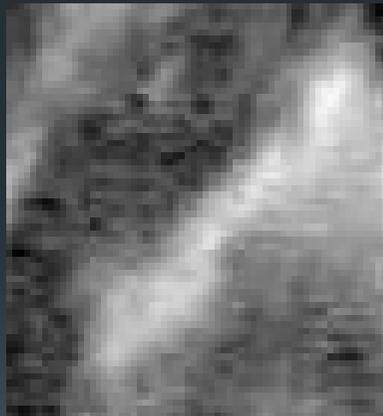
Focus of our team

1. Camera trap technology
 - Data management and processing
 - Image analysis
 - Building Automation Systems
2. Incorporation of associated technology into existing tools
 - Building efficient and reliable tools – field tested and robust
 - User friendly
 - Affordable

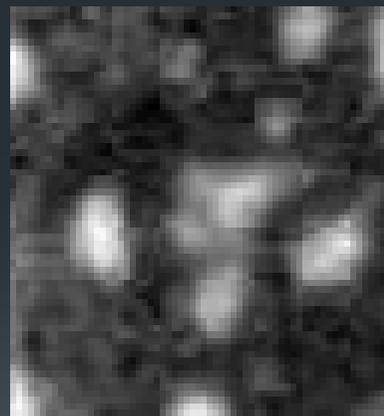


Camera Trap Image Automation

Feral cat



Quoll

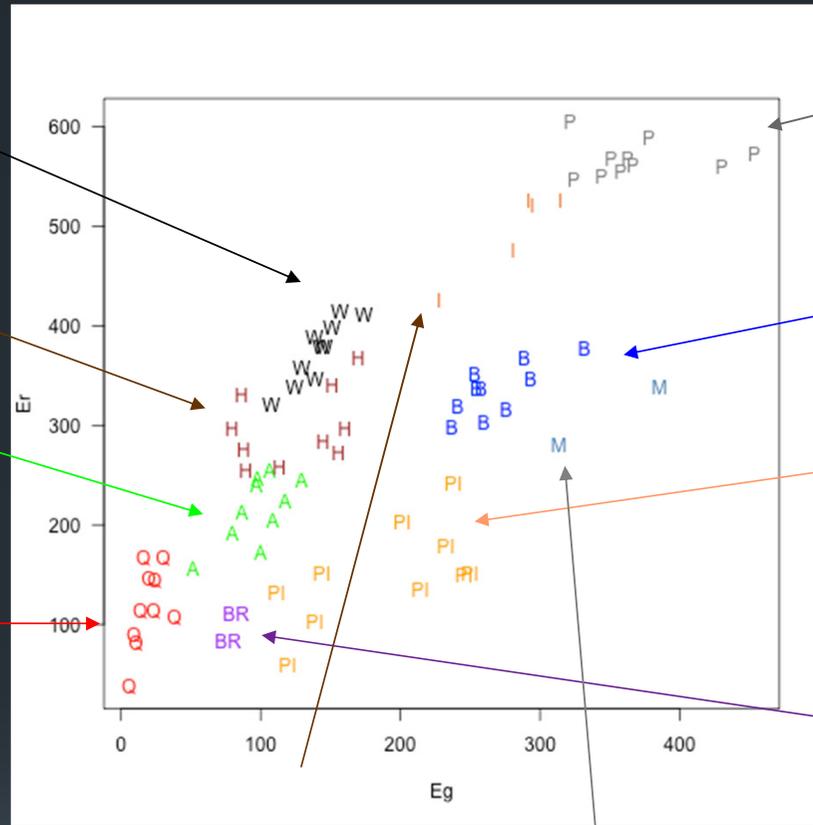


CLASSIFICATION →

	Cat	Quoll
Cat	10	0
Quoll	0	10

↓
TRUE

10-fold cross-validation: 95%

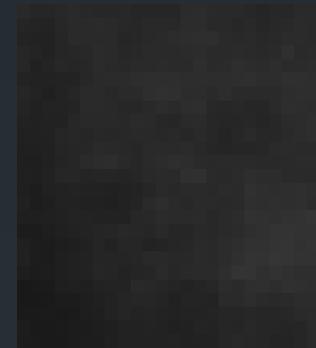


Falzon et al. (2014)

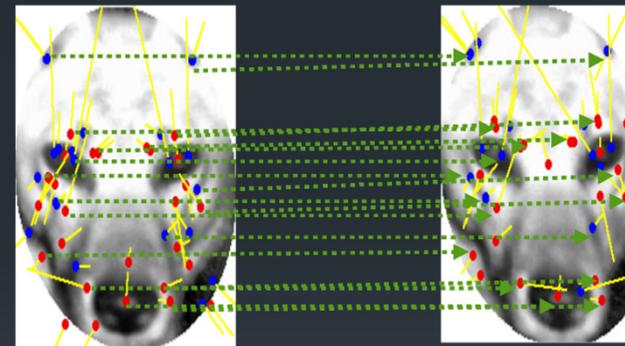
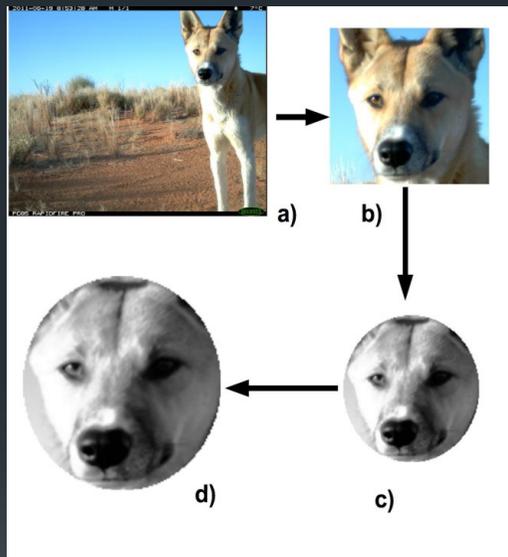


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Texture Analysis- Individual Pattern Analysis

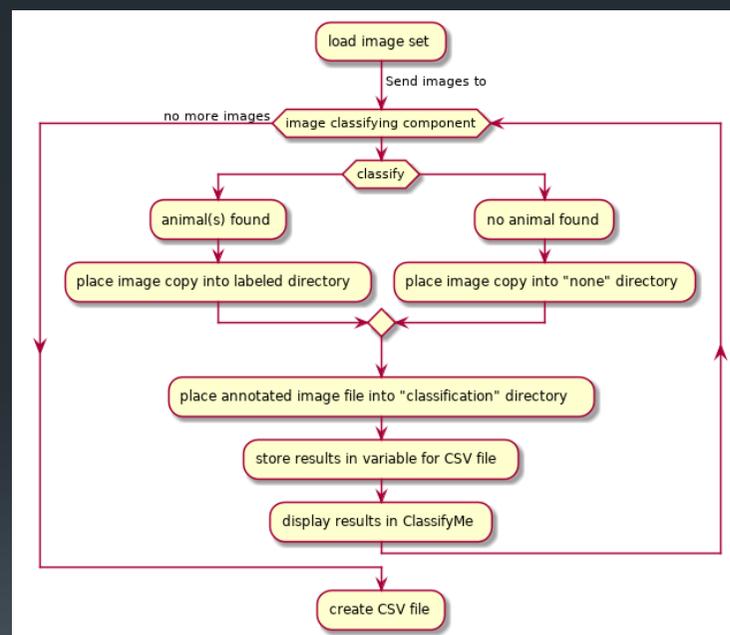


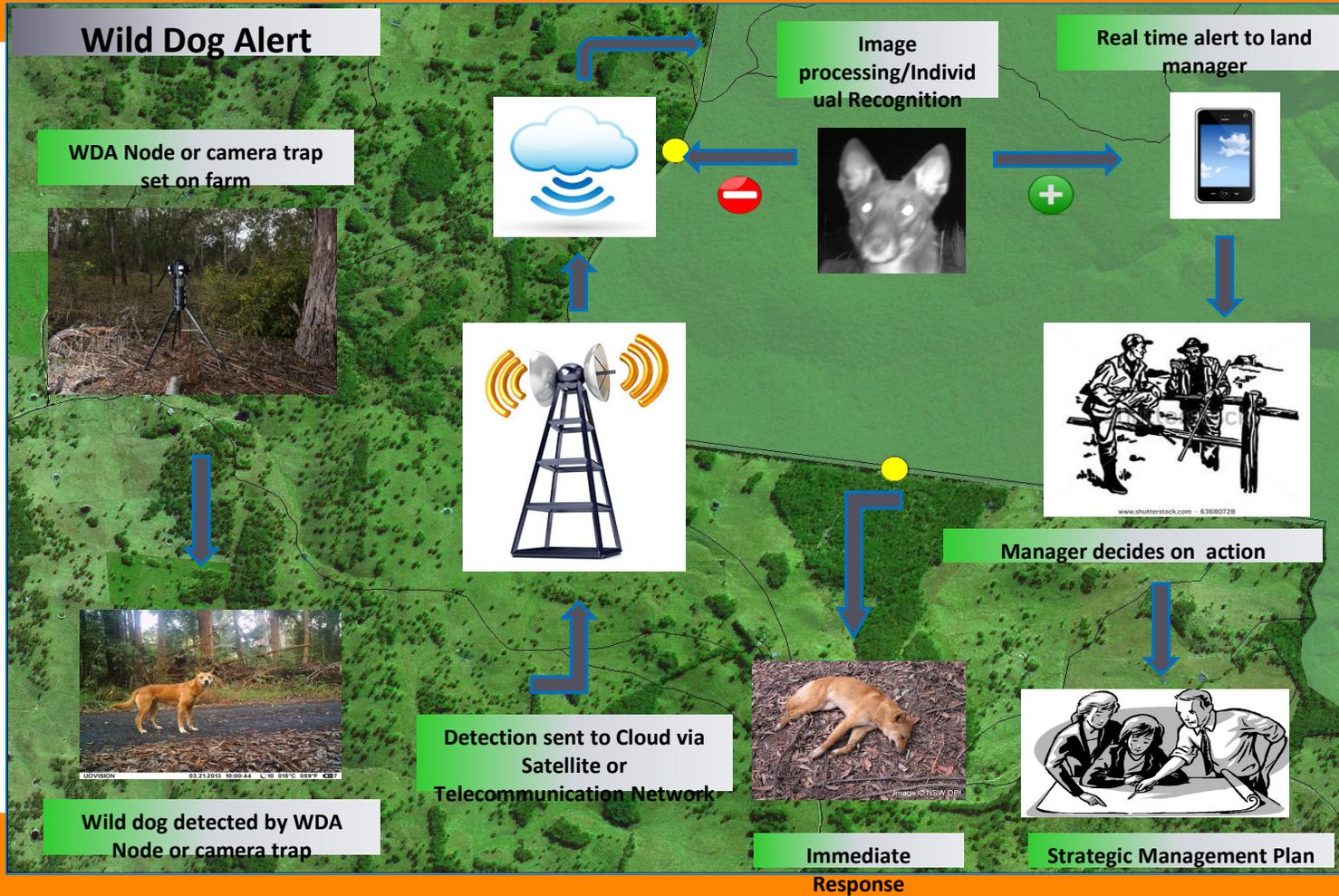
Wild Dog Facial Recognition Model



ClassifyMe

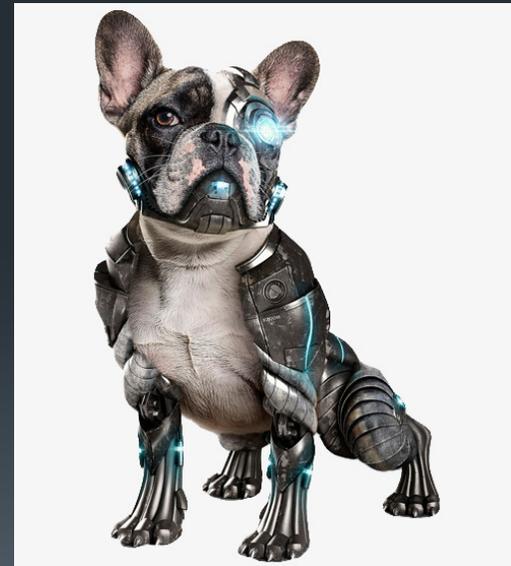
- Camera trap software
- Filtering capacity
- First step in automated analysis of image data
- First release trial Nov 2018



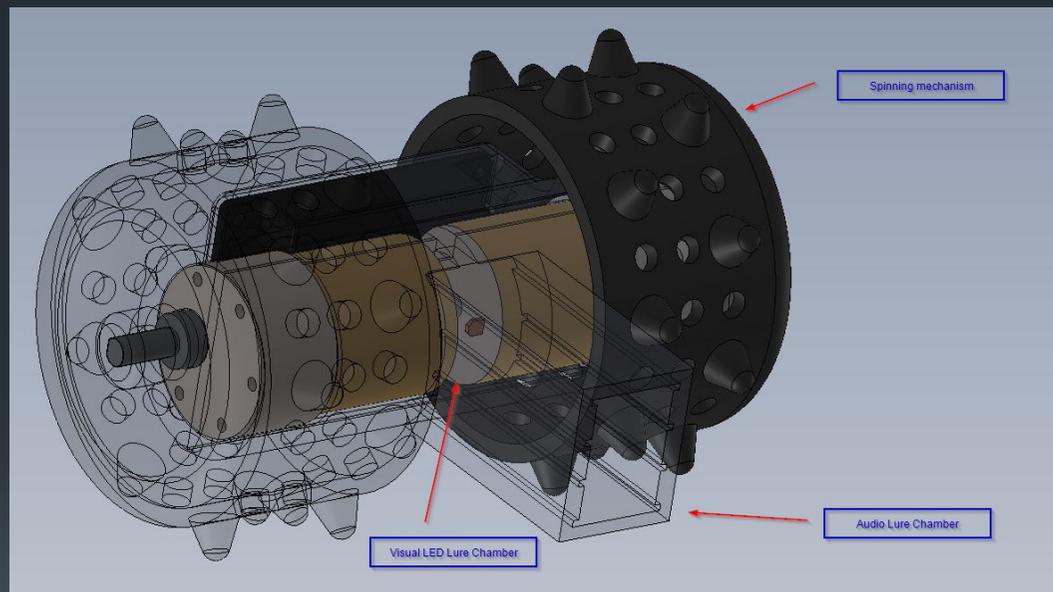


E-technology Hub

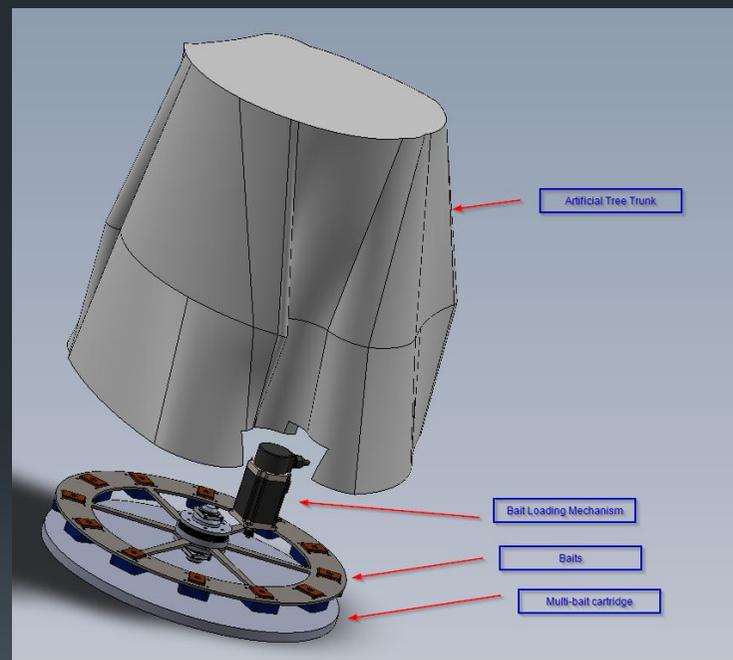
- Integration of technology developed in Wild Dog Alert Project to improve detection and efficacy of existing tools
 - Sentinel bait device
 - Automatic gate closure mechanisms
- Development of new and innovative approaches
 - Feral Cat Lure
 - Vision: Achilles Heel



Feral Cat Tactile Lure



Sentinel Bait Dispenser



Algorithms and Software

- Feral cat identification
- Quoll identification
- Feral pig recognition
- Wild Dog/Dingo recognition
- Fox individual recognition
- Macropod species recognition
- ClassifyMe soon to be field tested

Australian Designed Camera Trap ?



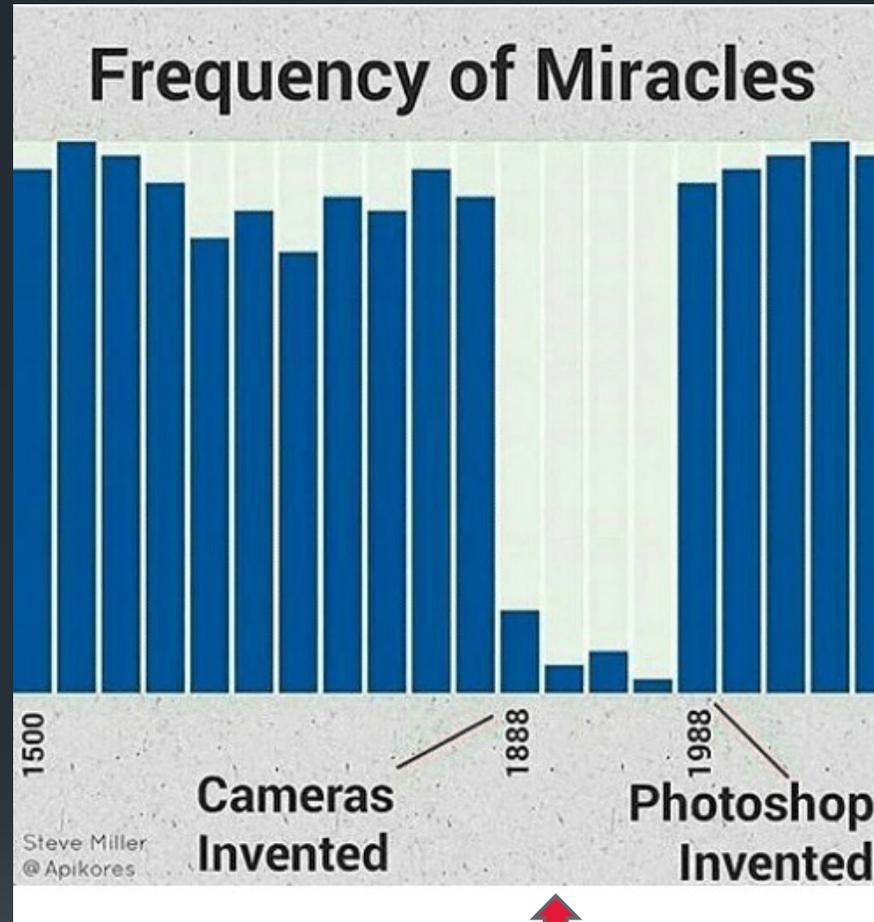
Contemporary Innovation

The Millennium Camera Trap

- Better quality camera traps
 - Anti-theft design
 - Smaller less conspicuous designs
- Improved detection reliability
- Iridium transmission
- Bluetooth technology
- Daisy-chain capabilities
- Remote data download for safety
- GPS capability
- Good price \$\$\$\$\$\$\$\$\$\$



Frequency of Miracles

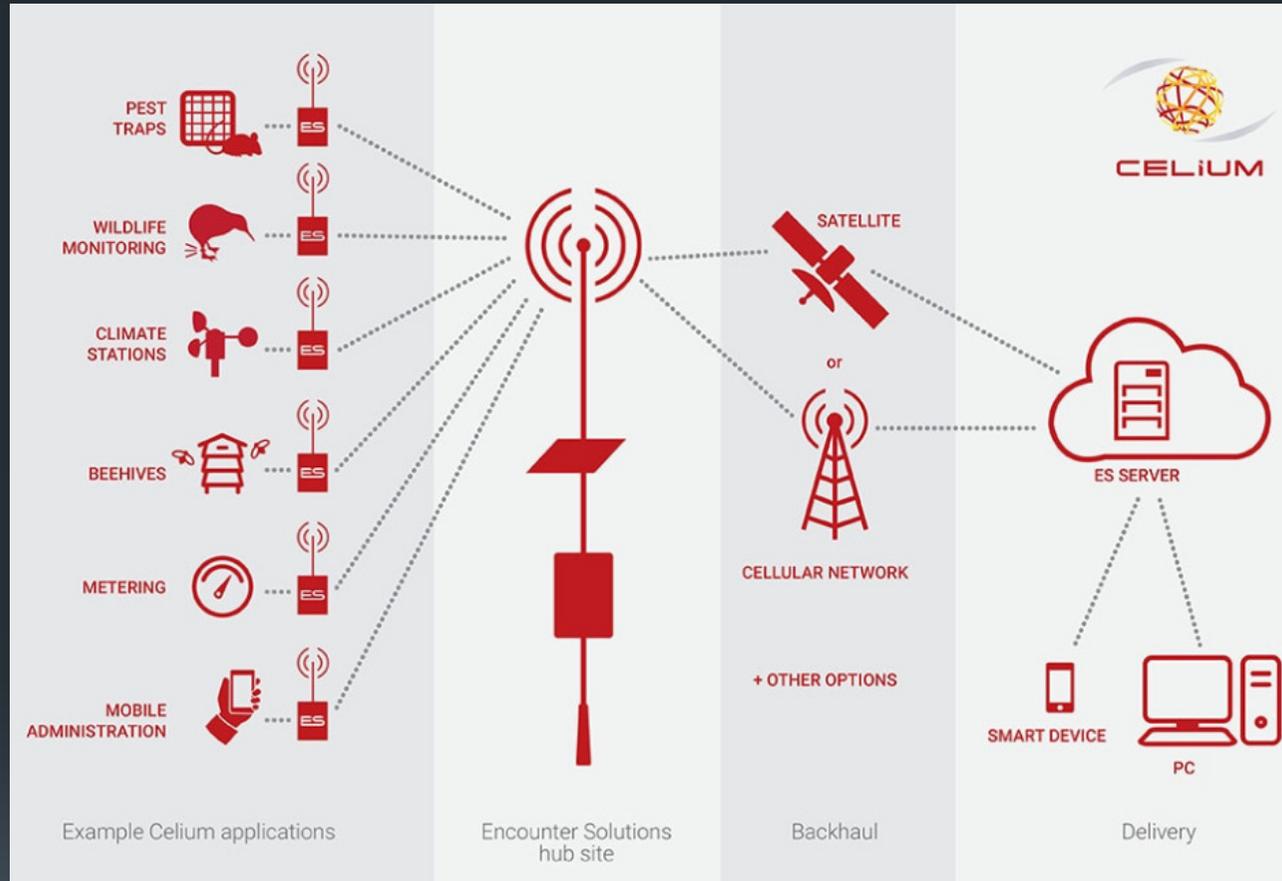


Likelihood of ultimate camera trap = good price \$\$\$\$\$



Foot-hold Trap Alert





Kiwi Speak'n



The Message



Below-ground node – The Mole



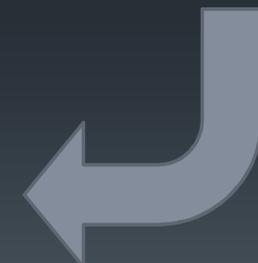
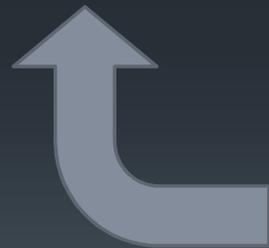
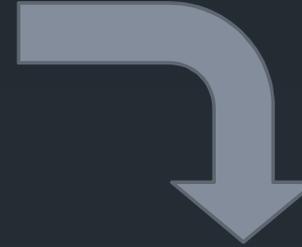
Plain Speak'n



Above-ground node – The Bat



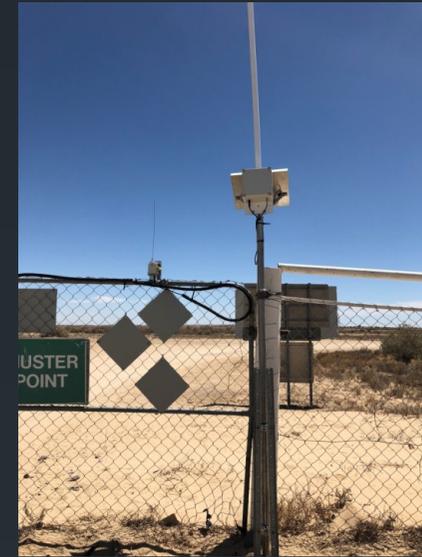
The Hub – The Albatross



Field Trials

Transmission trials to:

- Testing efficacy of a 3G/Iridium system in sending an alert upon capture using a foot-hold trap.
- Test the robustness and efficacy during a trapping program



Trapping Trials



Transmission Testing



Trap Alert Testing

- Trapped 35 dingoes - identified problems and resolved issues with the trigger system of the prototype
- Transmission Bat-Albatross in the dune system is >20 km
- Transmission Mole-Bat is 600 m in dune system
- Transmission trials continuing in gorge and coastal mountain country
- Project completion 2018



Plethora of Applications

- Automated gate closure systems
- Deer trap mechanisms
- Fox or feral cat detection system in fenced reserves
- Grooming trap (Felixer)
- Boar Buster
- Water point closure systems