



National Environmental
Research Program

NORTHERN AUSTRALIA HUB

Improving biodiversity
conservation in
northern Australia

Terrestrial monitoring with motion detection cameras

What is this research about?

Monitoring animals is a valuable tool in planning how to protect them and their environment. Wildlife surveys can show what species are present in an area and whether populations are declining, stable or growing. This is critical information for land managers to help them better understand the impacts of conservation and other management activities.

One survey method which is growing in popularity among Indigenous and other land management groups across northern Australia involves the use of motion detection cameras. Motion detection cameras are an efficient means of collecting data over long periods of time, with minimal input of labour and minimal stress to the animals being surveyed.



Black Wallaroo, Kakadu National Park.

However, for groups to collect meaningful information with cameras, it is important they use a rigorous standardised method, which will allow them to compare results between different areas and through time.

A new protocol for wildlife surveys with cameras

Funded by the NERP Northern Australia Hub and the Northern Territory Department of Land Resource Management, Northern Territory Government scientists have developed a protocol for wildlife surveys using motion detection cameras.

The scientists worked with Indigenous rangers in the Warddeken and Djelk IPAs and at Fish River Station to trial the method and to ensure that it was both scientifically robust and practical for land managers to implement. Indigenous land managers are becoming increasingly involved in delivering biodiversity conservation activities, such as feral animal control. This project has also given the rangers involved increased practical knowledge about scientific monitoring, assessment and reporting that they can use in managing their land and communicating with other agencies.

The protocol and detailed supporting information are outlined in *A guide for the use of remote cameras for wildlife survey in northern Australia*, which is available at <http://www.nerpnorthern.edu.au/publications/citation/nerp700>



The guide provides detailed information on:

- General uses and application of motion detection cameras for wildlife projects
- Planning and implementing remote camera surveys across northern Australia
- Camera types
- Setting cameras in the field
- Other equipment requirements
- Targeting different mammal species
- Baits and bait stations
- Data collection and storage
- Picture analysis and statistical requirements

This fact sheet provides a sample of some of the key points contained within the guide.

Camera survey features

- Less labour intensive method compared to other scientific monitoring methods, such as cage traps or spotlight surveys.
- Highly accessible tool; the method can be used by park managers and rangers, Indigenous land management groups, environmental consultants, students and naturalists.
- Appropriate for use in remote areas, where the cameras can be left for an extended period of time.
- Relatively non-invasive; animals don't need to be captured or handled as part of the survey.
- More suited to detecting mammals and, to a lesser extent birds, as cameras sense warm objects.



Photo taken with a remote camera of a black-palmed Monitor (*Varanus glebopalma*) preying on a Northern Small-eyed Snake (*Cryptophis pallidiceps*).

Common camera applications

- Simple surveillance – document species that may be visiting one or a few specific sites, such as a watering hole.
- General biodiversity survey – used with other sampling methods to identify the species present within an area.
- Targeted wildlife surveys – motion detection cameras are used (either exclusively or with other sampling methods) to document the spatial distribution of targeted species.
- Population density estimation – an array of cameras can be used to estimate population densities in an area, in populations where there are uniquely marked individuals.
- Management evaluation - document changes in species occurrence or composition to help measure the impact of environmental management initiatives.
- Monitoring – document changes in occurrence and distribution of species.





Photo taken with a remote camera of a dingo (*Canis lupus*) preying on a Common Brush-tailed Possum (*Trichosurus Vulpecula*)

Resources

- While camera surveys are generally less labour intensive compared to other sampling methods, significant staff resources may still be required for extensive surveys. This includes resources for project planning and data analysis, which may require specialist advice.
- Motion detection cameras can be more expensive to purchase than other mammal survey equipment. This includes the camera itself and accessories (e.g. batteries, memory cards, bait stations).

Survey outcomes

The cameras record the presence of wildlife at a particular location and time. The photographs can be a valuable resource for researching or monitoring wildlife, when a robust scientific method is used to both deploy the cameras and analyse the photos. The results can provide valuable ecological and management-related information for decision-makers. However, there are a number of key points to consider when deciding how to best collect and interpret data:

- There is no guarantee that an animal will be photographed, even if they visit the camera site. This is called a false negative.
- An animal may not visit a camera site during the time of the survey; but it may visit at other times. This is particularly relevant for rare species, species occurring at low densities, or species with large home ranges.
- In most cases it's only possible to determine the type of species detected, not individuals (with the exception in some cases of animals with distinct markings or features).



A Reconyx Hyperfire camera attached to a tree.

Method

Motion detection cameras work by sensing objects that move and are warm relative to the background. How remote cameras are used and deployed should be tailored to suit the target species of the monitoring program. For example the focus location or height of the camera should be adjusted to suit the size of the target species.

Typically, the cameras are strapped to a stable object, usually a tree, and pointed in the direction of a bait station. It is recommended that cameras face south to avoid silhouetted images or false shots due to sunrise and sunset. Grass that could blow in the wind and trigger the camera is removed.

The full method is detailed in the guide.



A false trigger caused by a single blade of grass moving in the sensor view.



Djerk Rangers demonstrating how to set up a camera at a workshop in Darwin in November 2014.

You can access *A guide for the use of remote cameras for wildlife survey in northern Australia* at <http://www.nerpnorthern.edu.au/publications/citation/nerp700>

Further information

Contact Graeme Gillespie on 08 8995 5025.

You can also visit <http://www.nerpnorthern.edu.au/research/projects/41> and see a video about how to set up a camera trap for wildlife surveys at <http://www.nerpnorthern.edu.au/news/2014/video-how-set-camera-trap-wildlife-surveys>



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