

Monitoring and evaluation of pest management programs

It is essential to monitor the effects of any pest animal management activity to ensure it is having the desired results. Pest animals are one of many land management problems that can affect the functioning of agricultural production systems and ecosystems. These systems are complex and we do not fully understand them, so it is important to consider the effects different management interventions might have, and potential unexpected or unwanted outcomes. An important part of effective pest management is evaluating the results of a program against the outcomes you intended to achieve.

Ongoing, long-term monitoring and evaluation allows pest managers to:

- determine the effectiveness of the pest management intervention
- assess the management strategy and control techniques
- adapt management as necessary.

There are two types of monitoring that can provide valuable information about the effectiveness of a pest management strategy. *Operational monitoring* aims to assess the efficiency of the overall operation¹ - whether the management plan is operating efficiently in terms of materials, costs and labour/effort. *Performance monitoring* aims to assess the effectiveness of the management strategy - is management having the desired effect and achieving the objectives of the program? If the objectives are not being met, then the strategy may need to be modified or redesigned, or the program might need to stop until the situation can be properly assessed¹.

What to monitor

Monitoring is a crucial part of management but it can require a lot of time, money and effort, so it is important to determine the monitoring objectives: what information needs to be collected and why, when, where and how data will be collected.



Image: Annette Brown

Camera traps can be used to monitor pest animal activity.

Most importantly, it needs to be clear how the information will be used. Some monitoring data might be easy to obtain through routine processes (eg at lamb marking), while other data (eg breeding success and recovery of native animal populations) can require specialised collection methods and might be more difficult to determine. There are a range of monitoring techniques for pest animals² and their use varies depending on the target animal, the location, climate and time of year, and the equipment and resources available.

Monitoring is designed to provide evidence that the desired outcomes are being achieved through management. These outcomes are usually set out as objectives in a pest animal management plan (see [GENFS3: Planning strategic pest animal management](#)), and typically include a reduction in the level of damage being caused by pest animals, or reduced pest populations as an *indication* of a reduction in pest damage. Operational monitoring might show that the actual costs of control (eg dollars spent on contractors or equipment hire) are less than the anticipated costs, and thus demonstrate the program's cost-efficiency.

Monitoring potential non-target impacts and flow-on effects of pest animal management is also recommended, particularly if there is a risk or likelihood of potentially undesirable outcomes (eg removing introduced predators such as cats may result in the expansion of local rat populations³, or poisoning rabbits on offshore islands might affect predatory birds - see [GENCS3: Rabbit eradication on offshore islands](#)).



Image: NSW DPI

Sand pads can be used to monitor wild dog activity.

Analysing the monitoring data

Once monitoring data has been collected, it needs to be analysed – and the results should be used to improve or modify the program. Depending on the type of program and what is being monitored, data analysis can range from basic calculations (eg spotlight counts, project costings) to more complex statistical analyses using mathematical formulas and software (eg measures of density and absolute abundance). In most cases, data analysis does not need to be complex and simple calculations that enable comparison of the results against the expected outcomes can determine if the management program is working. It is important that data collection and analysis is carried out in a timely manner, and that results are communicated between all stakeholders (particularly to those people *doing* the control and monitoring) so that the planning and management actions reflect the most current monitoring results.

Monitoring data that shows the value and widespread benefits of a collaborative approach can be used to seek additional funding. Data that is communicated regularly can also help motivate participating landholders and data collectors to keep going with the program. Sharing positive results through newsletters, meetings and local media helps to boost support from the community and maintains the social license needed to continue pest management.

Program evaluation

The nature and extent of pest problems can change over time so management interventions need to be evaluated periodically to ensure that objectives are being met and to determine that management is still appropriate. Evaluation of a pest management program that is achieving its desired outcomes might indicate that operations can be scaled back or modified to run more efficiently.

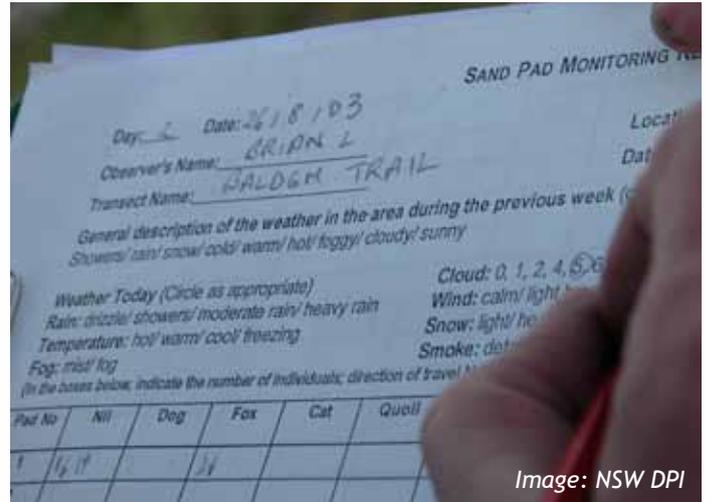


Image: NSW DPI

An example of a sand pad data recording sheet.

If monitoring data shows that management is not having the desired results, or if the operational circumstances have changed (eg there has been a severe weather event or financial loss), the control program might need to change or stop completely. An adaptive management approach uses monitoring data and program evaluation to inform decision-making about future management⁴. Monitoring ultimately provides pest and land managers with comprehensive data that can guide and streamline management planning, and help save on project costs.

Further reading

1. Braysher M and Saunders G (2003a). *PESTPLAN - A Guide to Setting Priorities and Developing a Management Plan For Pest Animals*. Bureau of Rural Sciences, Canberra.
2. Mitchell B and Balogh S (2007). *Monitoring techniques for vertebrate pests*. NSW Department of Primary Industries, Orange, NSW.
3. Hanna E and Cardillo M (2013). Island mammal extinctions are determined by interactive effects of life history, island biogeography and mesopredator suppression. *Global Ecology and Biogeography*, 23:395-404.
4. Australasian Wildlife Management Society (AWMS) (2007). *Position Statement: Adaptive Management*.

See also: <http://www.feral.org.au/pestsmart/best-practice-pest-animal-management/>

<http://www.feral.org.au/pestsmart/monitoring/>

Invasive Animals Ltd has taken care to validate the accuracy of the information at the date of publication [May 2014]. This information has been prepared with care but it is provided “as is”, without warranty of any kind, to the extent permitted by law.



PestSmart Toolkit