

Principles of pest animal management

The strategic approach to pest management promotes coordinated action that aims to reduce the damage caused by pests to an acceptable level in order to achieve a desired outcome (eg improved agricultural production or to conserve biodiversity). There are seven key principles that form the basis of the strategic approach. It is important to keep these principles in mind when planning and carrying out pest animal management.

What is a pest?

The term ‘pest animal’ is generally used to describe an animal that conflicts with human interests³. Such an animal may be destructive, a nuisance, smelly, noisy, out of place or simply not wanted. The definition of a pest is: those animals that cause more damage than benefits to human valued resources and social wellbeing. A pest may be an animal that was introduced and spread by humans to new locations. However native animals such as kangaroos, corellas or possums can also be classed as pests in some circumstances.

“ The aim of pest management is to reduce damage to an economically or environmentally acceptable level ”

Principle 1: A pest is a human-defined idea.

People decide whether an animal is a pest or not, and what is a pest to one person may be a valuable resource to another. The pest status of an animal can vary depending on the location, land use and the values and attitudes of the people who are concerned with the benefits and/or damage that the animal is causing. For example, a feral pig might be worth \$100 AU at the point of sale where it is processed into game meat for the European gourmet market, and viewed as a valuable resource by the hunters and meat processors.



Image: Invasive Animals CRC

Stakeholder engagement is an important part of effective pest animal management.

Others believe that feral pigs are a menace to the environment and agriculture, and should be controlled regardless of its value.

The pest status of an animal can also vary over time and with the same observer. For example, some banana growers in Queensland view feral pigs as a major pest when banana prices are high but a welcome guest when prices are low, as they clean up fallen fruit that can be a disease source to the crop.

Principle 2: Key stakeholders need to be actively engaged and consulted.

Different groups and individuals have different attitudes towards pest animals and how they should be managed, and this can determine success or failure of a pest management program. When planning pest management it is essential to consult those people who are affected by pest damage as well as those who might be affected by or need to be involved in pest management activities (see [GENFS3: Planning strategic pest animal management](#)). This is a two-way process where the landholders’ attitudes towards the pest and management options must be understood and valued equally to that of other stakeholders, such as government agencies that regulate pest management^{2,3,4}. Consultation requires active engagement, open discussion, and the development of trust between all parties. This is especially important where programs need to be coordinated across a broad landscape (eg wild dog management), requiring a range of landholders and groups to be involved.

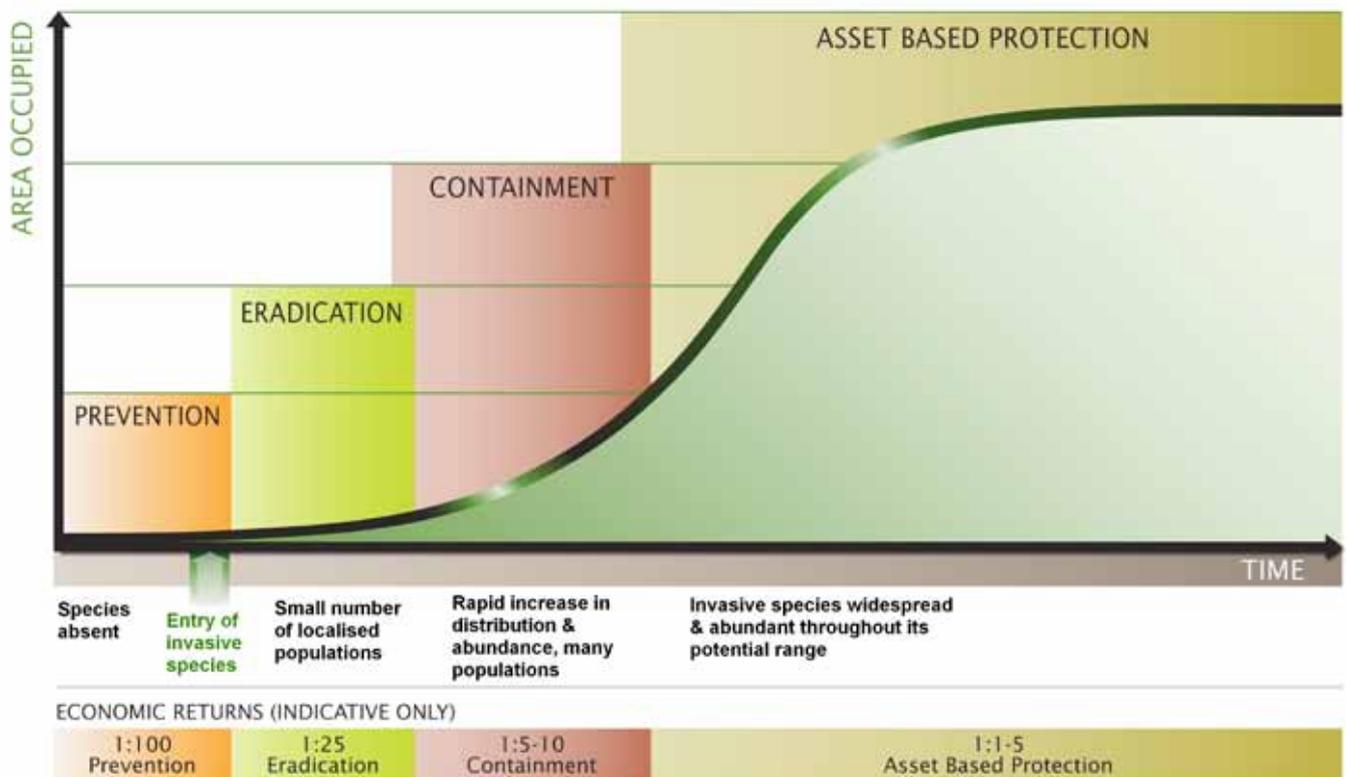


Figure 1: Generalised invasion curve showing actions appropriate to each stage. Preventative actions are the most cost-effective and the benefit-cost ratio decreases as an invasion progresses. Image: Victoria DEPI

If several land managers within the landscape do not cooperate and actively stop management, such programs can be ineffective.

When trying to work out the dimensions of a pest problem it is important to identify:

- who has the problem
- where is the problem and what is the extent or level of the damage believed to be caused by the pest, and
- what stakeholders want to do about it.

Building trust between diverse individuals and groups can be a difficult and time consuming process, but it is essential. Some participants may need to improve their knowledge and understanding of pest animals and the available control options, in order to contribute and make an informed decision about management⁶. The nil tenure or cross tenure approach can be a useful method for reducing conflict and reaching decisions on cost sharing⁶. This process involves key stakeholders coming to a joint understanding about the damage that pests cause, knowing where

pests move throughout the landscape and where to implement management using a map with no tenure boundaries².

Is eradication possible?

Principle 3: Pests are rarely eradicated.

Once a pest population is established, eradication (ie complete and permanent removal of a pest) is difficult to achieve. It is therefore essential to minimise the risk of new pests entering a region and to quickly remove individuals before they have a chance to spread and establish breeding populations, if they are found in the wild (Figure 1). This is the 'Prevention' stage of the 'invasion', where the area occupied by the pest is small and the economic return of management is high. The second stage, 'Eradication', is only possible on some islands or where pest populations are very small and isolated (see [GENCS3: Rabbit eradication on offshore islands](#)). This is because a successful eradication program must ensure: i) that the control operation can remove the pests faster than they can reproduce, ii) that immigration of pests from another area or source can

be prevented, and iii) that all reproductive individuals are able to be taken by the control techniques available^{7, 10}. Meeting these criteria is rarely possible and/or very difficult to achieve over a large area¹⁰.

Principle 4: Most pest management needs to focus on the outcome, not just killing pests.

When a pest species can no longer be eradicated or contained because they have spread and multiplied in number, management switches from a focus on the pest itself, to ‘asset protection’ – or reducing the damage that pests cause to assets, to an agreed, acceptable level. While it is relatively cheap to remove an individual pest when overall population densities are high, there comes a point when removing pests becomes more expensive than the benefits gained. The point at which the cost of management outweighs the benefits can be difficult to determine, however an effective monitoring program should help determine if and when this point is reached (see Principle 7 and [GENFS4: Monitoring and evaluation](#)).

Whole of system approach

Principle 5: A whole of system approach is required for managing pest damage.

Pest animals are one of many land management problems that can affect agricultural production and biodiversity^{1, 4}. Weed and water management, habitat quality, livestock genetics, nutrition, climate and rainfall can also influence desired land use outcomes (eg conservation of endangered wildlife, see Box 1). It is important for land managers to consider the function of the overall system when deciding where to use limited resources to achieve the best outcomes.

Principle 6: Most pest management occurs in ecosystems of which our knowledge is incomplete.

Other factors can add to the complexity of pest management, such as:

- the biology and behaviour of the pest and the affected wildlife, livestock and people
- the availability of control techniques
- the variable interests of the key stakeholders
- cost:benefit ratio of management actions.

By placing pest animal management in the context of a whole system, land managers gain a better understanding of the impacts of pest animals, and can focus on managing all resources to achieve the best outcome.

Box 1: Managing the whole system – pest management for conservation

Malleefowl (*Leipoa ocellata*) are preyed upon by foxes. One study found that there was little recovery in Malleefowl numbers after extensive poisoning of foxes. A later study showed that, although foxes were important predators, Malleefowl numbers did not increase after fox control because the necessary food for chick survival was not available. Managing grazing by domestic stock, feral goats and rabbits to restore native grasses and their seeds on which the chicks fed was as necessary as reducing fox predation for Malleefowl population recovery^{8,9}.

It is important to acknowledge that our understanding of these complex and dynamic systems is incomplete, so it is difficult to know how the system will respond to management actions or whether desired outcomes will be achieved.

An adaptive approach to management takes this into consideration, enabling land managers to monitor and evaluate the effects of management, and adapt their actions accordingly.

Planning & Monitoring

Principle 7: An effective monitoring and evaluation strategy is essential for all management action.

It is essential to monitor the effects of pest management actions, and to evaluate whether these effects are producing the desired outcomes. A monitoring and evaluation plan provides critical information that can guide future management decisions, such as whether the program needs to be modified or how it might be made more efficient; or whether the pest is actually causing the damage, or if there are more significant factors at play (eg poor livestock genetics causing lamb mortality). Monitoring can be resource intensive so it is important to determine:

- what data needs to be collected
- when or how often it needs to be collected (eg every day, once a month)
- where it should be collected (eg photopoints)
- how it will be collected and used (eg camera traps, photopoints, live trapping, vegetation surveys). See [GENFS4: Monitoring and evaluation](#).



Planning for successful pest animal management requires a whole of system approach. Image: Jessica Marsh

More information

The principles of pest animal management form the basis of what pest management experts call ‘the strategic approach’ – a process of defining what the pest problem is and working out what outcome stakeholders want as a result of doing pest management, and developing an effective plan of action to manage pest animal damage.

Planning for successful pest animal management is achievable by following a series of steps – these are outlined in [GENFS3: Planning strategic pest animal management](#).

See also: [PestSmart Toolkit for Best Practice Pest Animal Management](#)

References

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PestSmart Toolkit