Managing production losses due to wildlife on farms

Planning Guide

A planning toolkit for managing browsing and grazing losses from wallabies and brushtail possums on farms in Tasmania.

Wildlife Management Branch
Department of Primary Industries, Parks, Water and Environment

Australian Government
Tasmanian Government
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In Tasmania, Bennett’s wallaby, Tasmanian pademelon (rufous wallaby); collectively referred to as wallabies, and brushtail possums have been at historically high populations since the 1990s. These significant increases have occurred state-wide leading to the current situation where these native animals are considered significant economic pests on many farms due to the high levels of pasture and crop losses being experienced by primary producers.

The aim of this document is to provide guidance and practical information on how to effectively manage wildlife problems in Tasmania, based on contemporary pest management principals. Information has been sourced from the Alternatives to 1080 Program and officers within DPIPWE’s Wildlife Management Branch on how to apply control options within an integrated framework to achieve the most effective control of damage appropriate for individual properties.
How to Use this Guide

This guide steps you through a process of identifying the browsing issues on your farm through to helping you develop a monitored plan specifically for your situation. The outcome is a wildlife management strategy tailored to suit your property and needs.

There is no simple, easy or magic solution to managing losses caused by wildlife in our current environment of high species abundance. The way forward is to know what you are losing and why you are doing what you are doing to manage these losses. It is essential to undertake systematic and effective control of wildlife to achieve farm viability. This planning tool aims to provide the guidance and information required to enable landholders to do this in a five step process.

It is important to focus on managing your browsing losses instead of focussing on the overall amount of wildlife controlled. This involves looking at the most effective strategies for reducing the damage caused by wildlife to your overall farm viability.

The following five step process which underpins modern pest animal management strategies will be used:

1. Defining the problem.
2. Deciding your objectives (and performance criteria).
3. Identifying appropriate management strategies and techniques.
4. Implementing management.
5. Monitoring evaluation against objectives.

This Planning Guide and the Wildlife Management Strategy Workbook have been designed to be worked through at the same time cross referencing each other as you go. It may be helpful to review the Case Study on pages 13 of this guide before you start.

As you progress you will understand more about the trade-offs between the problem, your objectives and the cost and effort of the different control options. You may choose to review each in turn to find your best mix. So don’t be concerned if you don’t have all of the answers up front. As you work through the guide and tease out various issues different aspects will become clear.

This workbook has been designed to enable landholders to work through each of the five steps independently, at an individual pace.

For those landowners with Property–based Wildlife Management Plans (PBWMP), it is envisaged that details of your Wildlife Management Strategy can be incorporated into your existing PBWMP by contacting the Wildlife Management Branch.

Ensure there is adequate border space around your map for notes.
1.2 What is the Problem?

Although this may sound strange, the presence of wallabies and possums on your property isn’t the problem in itself, it’s the combination of the pasture or the crops they eat, how much they eat (identified in 1.1) plus other concerns for example parasitic management and pasture composition. There are other wildlife species to consider as well, so don’t limit your analysis to wallabies and possums.

Look at your map generated in 1.1 and ask yourself what is it you’re trying to protect. Is it wildlife browsing impacts to pastures you’re trying to rest? Or perhaps it’s areas where you plan to re-generate pasture or sow future crops? Is it a year long problem, or seasonal?

Be clear about what problems are being caused by what species and at what times across your farm annually.

If your map is big enough write notes next to each area, or if not write a number or name next to each of the different paddocks or areas on your map.

You might find it easier to concentrate on a different property area at a time by enlarging each area on its own page to allow the space for detailed notes.

Summarise your notes and detail these problems on page 4.

1.3 How Critical is the Problem?

Understanding the dollar value of your losses is probably the most important step in this entire process. If you regularly lose 20% of your crop, or you are now running 20 head of cattle less in an area than you did five years ago, these could be good indications as to how big your problem is.

If you don’t have this sort of information, then try to at least think about areas in terms of high, moderate and low damage and think about how important these problems are relative to all of the other issues across you property. Not everything can be the number one priority.

What you might like to consider is placing several exclosure cages various distances from your bush edge as a means of quantifying your actual losses for future planning.

It is important to put a dollar value on your losses, even if it is only a rough estimation.

There is also a program called BITE, which is a decision support tool designed to predict pasture losses to browsing wildlife throughout Tasmania. More information is provided in the Information Booklet.

Monitoring and Measuring Pasture Losses to Wildlife

Detail your loss estimates on page 4.
1.4 What Species are Involved

Most landowners would be aware of the species present on their properties from shooting records. If you’re unsure of what species are on your property the best way to find out is to go out quietly with a spotlight at night and observe what species are out on your pastures. Combine these observations with faecal pellet observations during the day.

You should be careful in making assumptions about the abundance and impact of species simply from the number you see.

In a trial funded by the Alternatives to 1080 Program, no brushtail possums were seen over three nights of spotlighting, but 28 were poisoned over the next week, and in a separate trial, specialised infra-red monitoring equipment showed that spotlighting only counted about 10% of animals present on a particular trial site.

Spotlighting will help you identify what species are present, and once you have identified which species are present in each paddock, you can begin to consider where they are coming from (how big the catchment is). Knowing the species mix and likely abundance will help in selecting the appropriate mix of control options. For example if you are surrounded by wattle forests with brushtail possums everywhere, then fencing is unlikely to be a viable control option.

1.5 Where are they Coming From?

Research undertaken with GPS collars on wallabies showed that Bennett’s wallabies are regularly travelling 2-3 kms through bush in a night to visit pasture areas, with some travelling from up to 5 kilometres away. Tasmanian pademelon (rufous wallaby) are travelling 1-2 kms, and brushtail possums have been shown to travel 3 kms. Use Google Maps or your own maps to measure how far away your problems are. You might need to cross check the details you made on your neighbouring properties from the Workbook. A property with small patches of bushland and creeks and gullies scattered throughout is likely to adopt different strategies than one which is mainly pasture with a large contiguous forest area on one side.

1.6 What are you Already Doing?

Most landholders are usually already doing some form of shooting, poisoning or fencing on their property to help control their problem. If you have fencing in place then draw these on your map, if you regularly shoot areas, go back over the data and get it clear in your mind how much effort you’ve been putting into shooting (number of nights x hours effort) over the last few years and what numbers you have been taking. Also look at your shooting logs (if you keep them) and think about what proportion of animals you’re seeing opposed to what you’re shooting.

Is your current shooting strategy effective?

Consider when doing this, what is occurring on your neighbours properties. If your neighbours have stopped shooting in recent times, have constructed wallaby fences or converted areas to plantations then these will all affect what

Shooting Experiment

“I did a count from one spot and counted 43 wallabies using a normal spotlight. From exactly the same spot I then counted 143 wallabies using a thermal imaging scope, so I saw less than 1 in 3 that were there.”

John Dawson, Project Manager, Alternatives to 1080 Program.
is happening on your property. For example a neighbour who has recently wallaby proof fenced will have redirected animals to alternative food sources – this might mean you are now feeding these animals.

Detail your strategy on page 4.

1.7 What are your Constraints?

Are there specific constraints on your management of the problem, for example do you have a conservation covenant on or adjacent to your land?

Do you, or any of your neighbours, wish to not use certain control options such as poisons or lethal controls?

Are there houses within 250 metres of areas you want to shoot where the occupier won’t allow the discharge of firearms?

Is there infrastructure around the property which precludes certain types of controls?

Are there non target species on your property which prevents the use of 1080 poison?

Do safety considerations mean it is not possible to shoot at night?

Are there areas too steep, or too inaccessible to shoot or fence?

Do you have public roads, wombats, Forester kangaroos, fallow deer, flood plains, creeks and gullies which make fencing impractical or prohibitively expensive in certain areas?

Detail your constraints on page 4.

1.8 Neighbours

Landholders with smaller properties who have good relationships with their immediate neighbours may want to consider whether it’s worth looking at a coordinated approach. This will probably only be attractive if you’re both feeding the same native animals.

The other issue to consider is if changes are happening on nearby properties such as plantation developments, increased irrigation, ownership changes reducing nearby browsing control, or neighbours putting in wallaby proof fencing all of which may have positive or negative flow on affects on your property.

A sub-catchment approach coordinating browsing damage management, NRM North.

Detail relevant neighbour information on page 4.

Step 2: Set Objectives

Step 1 was designed to help clarify exactly what the problem is on your property, and to stimulate thinking about whether your current controls are effective.

Think about what you would like to achieve from your wildlife management strategy.

The purpose of Step 2, setting objectives is to think about what you would like to achieve from your wildlife management strategy. Don’t worry about the ‘how’ just yet, that will come next. For this step just concentrate on your objectives. They should be measurable and detail a timeframe.

In most cases the primary objective of wallaby and possum management in Tasmania will be to reduce or eliminate crop or pasture losses to wildlife grazing, but the exact objective decided will in part drive the approaches and timing of controls, and of course realise that there is a trade off between cost of control and protection. A strategy of local exclusion reducing browsing losses to native wildlife to <5% will require far more effort and cost than a strategy to reduce damage to less than 20%.

Some example objectives may include:

• To increase pasture production in paddock X so it can support an extra 50 sheep next year;

• To eliminate browsing in area Y through spring to allow new pasture to establish;

• To limit pasture losses to wildlife to under 15% through January – March and July – August.

Think about how you are going to know if you’ve achieved these objectives. Is it a higher stocking rate, and if so what does that translate to in terms of extra dollars? Are you prepared to put in pasture exclusion plots to see how much pasture you’re losing?

Detail objectives on page 8.

Other Wildlife Objectives

It might be useful at this point in time to also consider other wildlife management objectives you have on your property, for example:

• Do you have any conservation objectives for any fauna or flora species on your property or for areas of your property that may be impacted by wildlife management activities?

• Do you manage any game hunting objectives such as running a quality deer management program?

• Do you have any other wildlife species on your property which require management such as wombats, Forester kangaroos, fallow deer, sulphur crested cockatoos, rabbits, black swans or wild duck species?

• Are there other wildlife damage issues such as damage to fences or equipment that are a concern?
You may also have associated goals such as:

- To retain property control and knowledge of exactly who is present on the property at all times by restricting access to authorised personnel only.
- To ensure the safety of all shooters, hunters and property workers on the property.
- To reduce poaching and illegal trespass through the active involvement of the property hunters, DPIPWE staff and Police.

Private Land Conservation Program
Browsing Wildlife Management with fallow deer
Browsing Wildlife Species
Legislative Information for Landholders

Detail further objectives on page 8.

Step 3: Develop your Plan

Once you have a clearer idea of the problem and have your objectives defined, now is the time to look at the different control options available to you. The aim of this step is to decide the what, when, where, who and how.

There is no single solution.

When considering primarily pasture and crop protection, the main controls available are fencing, shooting and trapping, with 1080 poison still being available as a method of last resort.

The Alternatives to 1080 Program has shown that shooting, trapping and fencing can all be effective in reducing losses to wildlife, though they are usually more costly and time consuming than 1080 poisoning. More importantly what was also shown was that any control strategy that relies on local population reduction needs to be able to effectively reduce and maintain numbers at very low levels.

In line with the Code of Practice for Use of 1080 Poison for Native Browsing Animal Management*, the DPIPWE Wildlife Management Branch supports a process of prevention through the use of non-lethal techniques, and where necessary the use of effective and humane lethal techniques.


Pasture monitoring trials conducted within the Alternatives to 1080 Program demonstrated the majority of losses from wildlife browsing occur within the first 100 metres of the bush edge, with 80% of browsing losses occurring within 300 metres of this edge. This means the biggest financial gains are to be made by focusing your efforts on reducing browsing losses in the area closest to the bush edge. Findings from these trials suggested that the most effective way of doing this was through wallaby proof fencing combined with an effective shooting campaign. The integration of control options is an important take home message. For example using just one control tool will be far less effective.

The balance of controls which are appropriate on your property will depend on a range of factors including:

1. Your objectives
2. Species mix
3. Available funds
4. Size and topography of your property
5. Constraints
6. Magnitude of your losses

Approaches to Management

It is useful to consider the different approaches to management that are available to achieve your objectives as these will guide which control options you might consider.

At the highest level, there are two options; local eradication or strategic management.

Local eradication involves the complete and permanent removal of every individual of the targeted species from a property. Any attempt to achieve this result would come at a very high cost and is very unlikely to be a financially or practically viable option for landholders in Tasmania.

Strategic management on the other hand, is a much more viable option for control of browsing wildlife species in Tasmania, especially as it is usually high levels of abundance which creates the animal issue, not presence. There are three broad approaches of strategic management, all of which have practical applications in Tasmania:

1. One–off Control

One–off control actions can include a 1080 poison or an intense effort at trapping or shooting to reduce numbers at a critical time. However realistically once off efforts are probably only really suitable for enabling a longer lived crop such as trees or vines to get established beyond a browsing age or where wildlife populations are at quite low levels. Most wildlife control in Tasmania requires sustained or repetitive targeted management. Wildlife proof fencing could be considered a once off control effort, though ongoing maintenance and integration with other control tools will be required, albeit at a lower level than prior to the fence being erected.

2. Sustained Management

This strategy revolves around an initial knockdown in animal density to where losses are at an acceptable level, followed by ongoing effort to maintain damage levels within acceptable parameters. For properties who are able to utilise hunting groups, through game management agreements, to provide this maintenance effort this can be a very effective strategy for pasture protection when combined with monitoring to ensure effective control is being maintained. It becomes harder when a landholder has to undertake all of the shooting effort themselves amongst their other tasks.

3. Targeted Management

This strategy is applicable when there are certain critical times when wildlife management is needed. For example just prior to new crops or pastures being sown or during peak times in summer and winter when animals are moving further out from the bush edge onto properties seeking food. This might also be a useful strategy for individuals who are finding it hard to
invest the effort to undertake sustained control. Trapping may be considered where a light shy population of pademelons are causing unacceptable levels of damage and the option of fencing is simply not feasible.

All of our species will graze pastures and crops and although there may be certain individuals that are causing more damage than others, from a control perspective it is not possible to distinguish between animals which are and aren’t causing damage. Trials have clearly demonstrate that many animals pass through areas without feeding, and in this respect Feratox™ offers a future possibility for targeting control to only those animals which are feeding in an area and allowing those who are feeding elsewhere to pass through an area.

There is also a final option of no control, which should at least be considered. Whether this involves sacrificing areas of the property as marginal, or accepting that the costs of control may exceed the benefits, considering a strategy of no control at least allows you to consider the benefits achieved through undertaking control efforts.

**Timing of Management**

The best time to plan for browsing wildlife is before you sustain losses. Effective planning for browsing wildlife requires thoughts of wildlife damage mitigation at the same time farming activities are planned. For instance, pre planning to mitigate projected losses should be considered at the time a new crop or pasture development is considered - NOT after.

The timing of control options is also a major consideration. Implementation of control options needs to be preemptive of damage and mindful of breeding patterns. For example, shooting browser numbers to low levels prior to sowing pasture. Poor planning at this stage is a contributor to loss, sometimes of huge proportions.

Things to consider include the location and browsing history of the paddock or area.

Does the vegetation or terrain reduce the choice of control options?

Can effective control be achieved?

How will you brief and coordinate property shooters?

If you can’t effectively control browsers in the area before you sow what will you do?

The four main control options include Fencing, Shooting, Trapping and 1080 Poison as a last resort.

**Wallaby fencing is not a set and forget solution.**

Prior to fence construction it is best to lower the existing population of wallabies by using a lethal control method. After fence construction on-going fence maintenance and lethal population control will be necessary as even the best fence will still have some breaches which may need to be controlled by shooting or trapping. Regularly monitoring the pressure animals are placing on the fence is vital to the success of the fence.

If minimum pressure to a fence can be achieved through the integration of other control tools, the use of cheaper fencing materials may be a feasible option.

Depending on your species, fences may not be the ideal solution. Although ‘floppy tops’ and electrical outriggers can slow down brushtail possums, there is no such thing as a brushtail possum proof fence, and so integrated lethal control will still be needed for this species.

Normal wallaby proof fences also won’t stop Forester kangaroo or fallow deer, and if you have a number of wombats on your property then you may need to construct wombat gates in the fence or incorporate electrical outriggers and some culling may be required. Crop protection permits are required for the culling of wombats.

Finally rabbits will easily pass through a wallaby proof fence, so if these are a significant or growing problem on your property, you will need to consider using rabbit proof mesh for the fence and ideally added to the bottom of the fence.

**Fencing**

On properties with significant losses to wildlife browsing, the use of wallaby proof fencing is likely to be the foundation of a long term integrated solution to managing wildlife grazing losses. The strategic construction of fencing can in many cases pay for itself as you go along, and as well as providing a sustained reduction in animal numbers feeding on your property, it can be used to increase the effectiveness of other controls such as shooting, trapping and poisoning.

Wallaby proof fencing is usually only financially viable for higher productivity areas or areas with high losses to wildlife, although if replacing a fence anyway, the extra investment in wallaby proof fencing can provide a very attractive return.

**Shooting**

Shooting approaches include the use of recreational hunters, deer management, crop protection permits (spotlighting), commercial harvesters, professional culling operators and dogging teams.

Shooting can be an effective tool for all wildlife species, however the Wildlife Management Branch stresses the need to ensure that your shooting effort is achieving your crop protection objectives, and that you’re not just killing animals and hoping that this is making a difference. Thistle control provides a good analogy. Thistles are not ideally controlled by just hoeing out every second plant, every...
second year, or even every fifth plant, every 2 months. It is practically and economically better to put in a lot of effort up front and quickly get them to very low numbers initially, and then remove the occasional new plant germinating from wind-blown seeds. The same principals apply with wildlife control in pasture and cropping environments.

It doesn’t matter which shooting approach you use, what is important is whether you are going to be able to effectively reduce local population numbers to a level which meets your pasture or crop protection objectives.

The majority of your financial benefits from shooting are likely to be achieved by reclaiming those precious hectares directly abutting the bush edge.

It could be that if you manage a small property surrounded by bush with steep hills shooting may not be a viable option in achieving your objectives.

It is important if you have hunting groups on your property to ensure that their objectives and your own match. For example if you have hunters taking a few wallabies once a fortnight from your lower paddocks for their dogs and ignore all the brushtail possums, odds are that they are actually providing you very little crop protection benefits. That’s not to say that they should be stopped shooting, but rather that if your objective is to increase property productivity through culling activities, you need to focus on achieving and maintaining low numbers of grazing wildlife species where pasture or crop losses are highest, which is generally up near the bush edge.

If using the services of others to implement a shooting program, it is necessary to clearly communicate desired objectives and ensure regular feedback is provided from the results of an implemented monitoring strategy. It should never be assumed that people know what is expected of them.

Hunter management is a key component of property management in Tasmania. This is why hunter management is a key component of Property Based Wildlife Management Plans to ensure open communication between all parties and to formalise agreed arrangements. See Appendix 1 ‘Hunter Management’ in this booklet.

Although the effort and cost that goes into setting up and running a trapping program for wallabies and possums may seem high compared to shooting, trapping can be a cost effective technique, particularly in areas where there are high populations of Tasmanian pademelon (rufous wallaby) or brushtail possums that are either difficult to fence out or shoot, or where the terrain makes shooting very difficult, such as in marshy areas or near rivers and gullies.

Trapping also provides a control option to land managers who do not have the skill, time or equipment to manage an effective shooting program. It is also useful for farmers who are simply sick and tired of going out shooting after a long day’s work and can’t find others who would be willing to shoot for them.

Trapping is an option worth considering where landholders have neighbours who do not appreciate shooting at night, because trapping still allows a land manager to capture and remove animals, but the control activity can be done in the morning with a quieter, low calibre firearm.

Trapping is not considered to be a broad scale control option for larger properties.

Its use is more suited to a targeted area approach such as a paddock or for more intensive use on smaller farming operations.

**1080 Poison**

Under the 1080 Poison Code of Practice, landholders wishing to use 1080 poison to control Bennett’s wallaby, Tasmanian pademelon (rufous wallaby) and brushtail possum must prove that the use of 1080 poison is a method of last resort.

Specifically under the code of practice the use of 1080 poison will only be allowed in Tasmania where

1. There is an unacceptable risk to crop or pasture;
2. The use of 1080 poison does not pose an unacceptable risk to a population of non target species; and
3. Alternative control measures have been adequately considered and implemented as far as practicable and assessed to be ineffective.

When properly managed, 1080 poison can be used as a limited tool for the initial knock-down to get back on top of browser numbers before constructing wallaby proof fencing and using ongoing alternate wildlife management tools.

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**Trapping**

Wildlife trapping is a ‘rediscovered’ technique in Tasmania. New traps were specifically designed by Forestry Tasmania for the capture and destruction of Tasmanian pademelon (rufous wallaby), and are also very effective for capturing brushtail possums, but Bennett’s wallabies are very wary of traps and hence if this is your main problem species trapping is not a suitable control tool.
Step 4: Implement and Monitor Plan

Unfortunately having a plan on paper doesn’t fix things by itself, it’s just the starting point of the process. Now you have to implement the process.

What is critical at this stage is that you understand what your objectives are and how you can effectively measure if they are being achieved.

Monitoring needs to be a balance between effort and information. It’s no good putting in place an intense monitoring strategy that you can’t actually undertake. In saying this however, the importance of accurate record keeping cannot be underestimated.

In the Information Booklet you will find a section on Monitoring and Measuring Pasture Losses to Wildlife to help you consider different control monitoring strategies, but briefly the main options and their pros and cons are:

Spotlight Counts

Spotlight counting is perhaps the quickest and easiest method for determining animal presence but it is notoriously inaccurate for determining animal abundance. As such it is not recommended as a monitoring tool.

Shooting Logs

Nightly shooting logs which record number of animals seen and shot can be a useful indicator of control effectiveness, but not of abundance. For example if shooting logs consistently show high numbers of animals being shot, relative to what is being seen, but pasture losses are still not acceptable then this may be indicating the animals are queued into shooting or that the current level of shooting intensity is not adequate. Monitoring losses is the only way to complete the picture and determine shooting success. See Appendix 4.

Faecal Pellet Counts

Faecal pellet counts require a bit more effort, but setting up some semi-permanent transects across a property can be a simple way of determining the presence of animals across a property, and monitoring can be integrated with normal farming activities.

Costing Control Options

When attempting to compare the cost of each of the four control options it is important to consider all of the associated costs and not just the outgoings from the bank. The expected timeframe that benefits can be expected from the implemented control should also be considered during planning and financial requirement forecasts. For instance, 1080 poison is a relatively short-term solution where as wallaby proof fencing is a long term solution to managing browsing wildlife.

A significant benefit from the work undertaken during the Alternatives to 1080 Program has been the increased understanding of the extent of the economic losses being experienced by the agricultural and forestry industries due to the high abundance of wallabies and brushtail possums.

The cost-benefits of reducing economic losses by implementing effective control can outweigh the costs associated with the control.

An increase in the use of wallaby proof fencing is testament to this even though this option is considered expensive. Landowners who have achieved wallaby proof fencing are finding it will often pay for itself in a couple of years. A wallaby proof fencing calculator can be found at www.dpipwe.tas.gov.au/browsingmanagement to assist in forecasting the timeframe required to recoup the extra cost of wallaby proof fencing for individual situations with cropping and pasture.

In your workbook a table detailing the cost areas for each control option have been broken down into three categories; labour, vehicles and materials, and contractors. Some of the associated costs for trapping and 1080 poison can be found in the Information Booklet.

<table>
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<tr>
<th>Date</th>
<th>Hunters Name</th>
<th>No. hours hunted</th>
<th>Bennetts wallaby</th>
<th>Rufous wallaby</th>
<th>Brushtail possum</th>
<th>Feral cat</th>
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<th>Comments (day or night shooting)</th>
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Record keeping logs are recommended for shooting, fencing and trapping. Good records are the key to a successful management plan.
Pasture Plate Meters

Pasture plate meters are frequently used in dairy enterprises around the State. Pasture plates can be a quicker and simpler way of measuring pasture growth at different distances from the bush edge as a proxy for wildlife losses. However these need to be used with caution as there are traps for the unwary in their use.

Meat and Livestock Australia Pasture Ruler

A MLA Pasture Ruler provides a quick and easy way to estimate pasture mass and quality but is designed for use on moderately dense pasture.

Exclosure Plots

Exclosure plots are perhaps the ideal method for determining pasture losses as they are a direct measure of loss. However they also require the most effort to undertake. That said there are shortcuts that can be taken such as using the MLA pasture ruler; or using areas well in from the bush edge as pseudo-control sites to compare against pasture losses from sites near the bush edge.

Thermal Or Infra Red Counts

There are now a few contractors who are looking at equipping themselves with thermal and infra red equipment and providing a service of counting actual wildlife numbers present in farm areas. As this type of equipment does not disturb the animals it provides much more accurate assessment of animal abundance than spotlight counts, but like pasture meters it does require a good operator.

Effective monitoring means choosing the tools that provide you with the information you require at least cost / effort, which generally means those which can be most easily integrated into your normal farm activities.

It might also be worth thinking outside of the square when considering monitoring. For example if you have a hunting group on your property who provide a crop protection control service in exchange for access to game, perhaps some of these hunters could be engaged to monitor browsing impacts instead of shooting. This information could then be used to direct concentrated shooting effort to the areas on the property experiencing unacceptable browsing losses.

The other side to monitoring is determining how effective your implemented control options are in terms of reducing browsing impacts.

The first step to being able to do this is to have a record of what you have implemented.

Record Your Control Program

If you’re shooting or trapping then keeping a logbook of where, when and what you’re shooting including what you are seeing but not shooting and/or if you’re fencing, keeping a log of maintenance, particularly breaches and frequency of inspection and effort pertaining to fence maintenance is invaluable. This may sound bureaucratic but the reality is there are no quick fixes.

Over time shooting logs will indicate efficiency rates. A fencing log will indicate if the rate of breaches is reducing or increasing over time as well as centralise your findings with respect to the pressure game might be applying to your fence. This in turn allows you to evaluate if the period between fence inspection is adequate, or if your current shooting program is appropriate. Ultimately, this information will serve as a performance indicator when measured against your objectives. Detailing effort for instance, is vitally important for future decision making, from a time and cost perspective.

Without the ability to go back and look at what’s been done, it becomes difficult to evaluate the effectiveness of the plan.

Monitoring and Measuring Pasture Losses to Wildlife

A copy of all of the workbook pages can be downloaded from www.dpipwe.tas.gov.au/browsingmanagement

Step 5: Evaluate and Modify the Plan

At least once a year (maybe when your crop protection permits are due for renewal) it is worth sitting down and reviewing your plan to consider how well it worked. An option could be to include other stakeholders such as a hunter representative or a Game Management Officer.

Questions to be considered include:

1. Were the objectives achieved, and if not why not?
2. Are you planning any management changes? For example different crops to be planted or pasture regeneration plans which may affect your control strategy?
3. Are the objectives still applicable for the coming year?
4. What were the costs and how much effort was actually required to undertake the controls?
5. Can this level of cost / effort be sustained?
6. Could effort or control options be modified or improved next year?
7. Is the monitoring working? Is it too much effort?
8. Has anything changed in the area which may affect your control strategy such as new plantations or wallaby fences or changes of ownership / management on adjacent properties?
9. Are there any new ideas out there (eg. in Game Tracks* or that you’ve heard from neighbours) which are worth trialling?

If any of these questions lead to a modification to the plan then note this.

A copy of all of the workbook pages can be downloaded from www.dpipwe.tas.gov.au/browsingmanagement

The reality is that as long as you have a wildlife management problem due to species abundance, wildlife management planning will be an ongoing process.

* Game Tracks is the annual publication of the Wildlife Management Branch.
Copies available by phoning 03 6233 6556.
Tasmanian Case Study

Northwest Property – 2010

‘Northwest’ is a 293 hectare cattle and cropping property. 35% native bush or plantation. Neighbouring areas native bush and plantation.

Case Study – Overview

Since 1995-96 a gradual reduction in the number of breeding cows the property can support has occurred.

The traditional silage paddock once produced 60+ bales per year, but is currently below 10.

Annual fertiliser costs are $30,000 and some property paddocks are being termed as ‘sacrificial paddocks’ since stock have not been run on them for over 12 months.

The shooting program is not achieving the results required. The level of control currently being implemented is not significantly reducing the local wallaby population or the amount of pasture being lost to wildlife.

The Tasmanian pademelon (rufous wallaby) have learnt avoidance behaviour impacting on the effectiveness of the currently implemented shooting program.

The unsatisfactory performance of the fence (8-80-15 netting) as an effective barrier to achieve pasture protection.

Map 1: Aerial view of Property using Google Maps. Boundary image has been added for the purpose of case study and not provided by Google Maps.

Existing Browsing Damage Strategy

A shooting program consisting of 1 trip every 10 days (hours per trip varies). These spotlight trips are implemented by the landowner, family members and recreational wallaby hunters. The recreational hunter’s only harvest animals they are able to utilise resulting in small numbers of animals being harvested by them each trip.

Wallaby proof fencing has been erected using 8-80-15 netting along two sections of boundary (yellow lines on map) totalling 3.2 kilometres at a cost of $19,200. This cost includes site preparation and fencing materials but does not include labour.

Unfortunately, this netting configuration was incorrectly recommended. Netting 8-80-15 is not an effective barrier for Tasmanian pademelon (rufous wallaby), as the smaller animals are able to pass easily through the fence.
BITE predicted a reduction in farm productivity by 49%.

**Table 1** details the breakdown of predicted losses from the bush edge using BITE predictions.

**Assumptions:** Pasture Growth 9747 kg Dry Matter per ha per year, Enterprise beef at conversion rate $0.23, pasture utilised 60%.
**Step 2 - Set Objectives**

### Set Objectives Example

<table>
<thead>
<tr>
<th>Area</th>
<th>Objective</th>
<th>Timing</th>
<th>Measures of success</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whole of property</td>
<td>To limit browsing pasture losses to wildlife to under 10%.</td>
<td>All year.</td>
<td>Results of monitoring exclosure plots.</td>
</tr>
<tr>
<td>A</td>
<td>To utilise all areas of the property within 12 months.</td>
<td>12 months (July 14, 2011)</td>
<td>Running stock in this area.</td>
</tr>
<tr>
<td>B</td>
<td>Increase stocking rate in the paddock back to historical levels.</td>
<td>End of Year 1 - 40 additional cows or 480 DSE (average 12dse/cow)</td>
<td>Will have 6 pasture exclusion plots in paddock to measure pasture impacts. Will assess area monthly for presence of wallaby faecal pellets. Increase stocking rate for paddock.</td>
</tr>
<tr>
<td>C</td>
<td>To increase silage production by 600% in three seasons.</td>
<td>End of Year 3 (2013)</td>
<td>Cut 60+ bales of silage.</td>
</tr>
</tbody>
</table>

**Step 3 - Develop Your Action Plan**

### Action Plan - Monitoring Example

<table>
<thead>
<tr>
<th>Area / Objective</th>
<th>Action</th>
<th>Who</th>
<th>Timeframe</th>
<th>Cost / Effort</th>
<th>Success Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1</td>
<td>Conduct and place six exclusion plots in paddock: 2 at 10m from bush edge, 2 at 50m and 2 at 100m from bush edge.</td>
<td>Me</td>
<td>By August 15 (1 month)</td>
<td>$100 for mesh, and half a day for construction and setting out.</td>
<td>Exclusions in place.</td>
</tr>
<tr>
<td>B1</td>
<td>Set up faecal pellet plot.</td>
<td>Me</td>
<td>By August 15 (1 month)</td>
<td>Half an hour to put 4 pegs in the ground and clear existing pellets from area.</td>
<td>Pugs in ground, all existing pellets removed.</td>
</tr>
<tr>
<td>B1</td>
<td>Conduct 1-2 shoots per week for the next eight - twelve weeks with the aim of reducing the local population if not too wet. Investigate the requirements for the use of 1080 poison, and also wallaby proof fence design and construction costs.</td>
<td>Me</td>
<td>July 15 – Oct 30 (immediate start)</td>
<td>Fuel Time: 32 - 96+ hours. Ammunition A marked reduction in faecal pellets in October compared to mid July. Results of pasture monitoring via exclosures. Consider other control options.</td>
<td></td>
</tr>
<tr>
<td>B1</td>
<td>Replace netting on existing 2km of wallaby proof fencing (yellow) and construct 1.2km of additional wallaby proof fencing (orange).</td>
<td>Contractor</td>
<td>Nov 30 (4.5 months)</td>
<td>Replacement fence - $5,500 - $7,000 materials + contractor costs. New fencing - $12,000 materials + contractor costs.</td>
<td>Netting replaced.</td>
</tr>
<tr>
<td>B1</td>
<td>Monitor pressure on fence, conduct 1 shooting trip per week initially using the fence to improve shooting efficiency and carry out necessary maintenance to the fence. Keep a log for each referencing when too wet to shoot.</td>
<td>Me</td>
<td>Dec 1 – ongoing</td>
<td>Ammunition, vehicle costs + own labour Lack of evidence of animals tracking along fence. Minimal breaches or % pasture loss based on exclusion results. Review log for shooting and fence maintenance and breaches.</td>
<td>Fencing constructed.</td>
</tr>
</tbody>
</table>

**Step 4 - Implement And Monitor Plan**

**Future fencing strategy.**


Exclosures erected late winter to monitor effectiveness during spring of implemented controls.
Hunter Conduct And Safety  (Taken from Property Based Wildlife Management Plan)

Property Hunters

Think about the number of hunters who can safely operate on your property and your shooting needs. What working arrangements need to be put in place.

If you have hunting groups should there be membership criteria and arrangements

Would hunters be required to be covered by separate insurance, such as that offered by some hunting/shooting associations.

Do you require hunters to sign a waiver and indemnity prior to shooting commencing.

It is a good idea to record hunter contact details. This may involve selecting one main contact for each group.

Hunter / Hunting Group Objectives:

- To retain access to the property for hunting.
- Have the opportunity to participate in social gathering and develop friendships with like-minded people.
- To actively participate in a successful property-based wildlife management plan.
- To improve wild deer herd quality through the implementation of Quality Deer Management practices.
- To provide hunters with the opportunity to be involved with wildlife management and control on the property.
- To ensure that sustainable wildlife populations are maintained for future generations.
- To provide education, training and hunting opportunities to young hunters.
- To maintain effective lines of communication between hunters and property management.
- To conduct organised wildlife culling programs as required by the Owner.
- To participate in the collection of data which will provide for the better management of wildlife on the property.

Agreement / Hunter Responsibilities

- Payment of the agreed property entry fee.
- Payment of hunting group membership fee.
- Regular attendance at hunter group meetings.
- Minimum of _____ trips per year (non-deer season) to control wallaby, possum and other wildlife species.
- Recording the details of all wildlife species taken and seen on the property.
- Ethical, lawful and responsible conduct whilst on the property.
- Ethical, lawful and responsible conduct whilst on the property.
- Where game hunting, holder of the relevant game licence (wallaby, deer, duck, pheasant or quail).
- Compliance with the property rules and the provisions of this management plan.
- Reporting any suspicious activities to property management or the authorities and record relevant data in property’s logbook.
- Participation in initiatives to deter poaching.
- Approval from the property Owners is needed if hunters wish to bring guests on to the property. All guests must be accompanied by a property hunter.

Property Security

Would property hunters be your agents, and therefore authorised under the Police Offences Act to ask for the names and addresses of people trespassing and to request that they leave the property immediately by the most direct route?

Are there any other security issues on your property?

Additional Permitted Activities

Are there activities hunters would, or would not be permitted to do on your property? These may be fishing, camping, firewood cutting (require a current chainsaw certificate?), bushwalking, horse riding, use of motorbikes and hunting dogs.
Hunter Code Of Safety

One of the main objectives of firearm safety is to reduce the incidence of firearm accidents. In reality, there is no such thing as a firearm accident. In every case at least one of the firearms safety rules will have been broken. It is essential that all hunters are aware of their responsibilities to themselves, their family and to fellow hunters. Therefore, all hunters are required to abide by the following Firearms Safety rules suggested by the Police Tasmania.

1. **Treat Every Firearm As Being Loaded**
   Check every firearm yourself. Ensure that the firearm is unloaded and that the action is open when carrying, accepting, passing or when removing it from storage. Remember, it is the “empty” firearm that kills.

2. **Always Point Firearms In A Safe Direction**
   Whether loaded or unloaded, make sure that the muzzle is pointed in a SAFE direction.

3. **Never Have Loaded Firearms In The Car, Home Or Camp**
   Ensure that when entering a car, house or camp all ammunition has been removed from all firearms.

4. **Identify Your Target And What Is Behind It**
   Make certain of your target before shooting, also be aware of what is behind your target.

5. **Never Fire At A Hard Surface Or Water**
   Consider the area your target is in: could a ricochet occur? A ricochet will almost certainly result from shooting at smooth or flat surfaces, water or rocks.

6. **Store Ammunition And Firearms Separately**
   When not in use, your ammunition and your firearm are to be stored separately under lock and key in appropriate cabinets.

7. **No Alcohol Or Drugs Prior To Or During The Use Of Firearms**
   Alcohol, drugs and medicines impair judgement. Good judgement is the key to the safe use of firearms.

8. **Do Not Climb Fences Or Obstacles With Loaded Firearms**
   Make sure before attempting to climb through the fence or negotiate any obstacle that your firearm is unloaded. Do not rely on safety catches. Observe this code and insist that others do the same.

An Example Of Property Rules
All hunters are required to:

- Act in a responsible and ethical manner at all times.
- Not exceed the speed limit of 40 kph on any property road, especially at night.
- Drive only on formed tracks, especially during severe weather.
- Seek approval from property management before lighting fires.
- Avoid causing damage to locks, fences, gates or any other such structures.
- Sign a ‘Waiver and Indemnity’ form before hunting on the property.
- Record the species and number of animals sighted and harvested in the data collection book before leaving the property.
- Foster good relations with fellow hunters, neighbouring property personnel, DPIPWE officers and the Police.
- Dispose of all rubbish, especially around camp sites. Take all litter home, including that which is not yours.
- Notify property management of any broken fences, escaped stock or property that has been vandalised.
- Promote and participate in the conservation of all flora and fauna.
- Take care not to disturb stock or cause damage to trees.
- Minimise disturbance to property works and activities.
- Ensure all camp fires are extinguished prior to leaving the property.
- Hunt only on their allocated hunting area unless special permission is obtained from the Owner to hunt another area.
- Attend the property on the number of visits as determined by the Owners for the control of browsing animals and to assist with property security.
RE: Permission to Shoot - Firearms Act 1996

Date: ........ / ........ / 20 ..........

I wish to advise that I am the owner/manager of the property known as ............................................................
Situated at ...........................................................................and comprising .......... hectares/ acres.

I hereby grant permission to (full name) ...............................................................................................................
Of (residential address) ...........................................................................................................................................
With Firearms Licence number ....................................................................................................................................

To enter my property and use firearms for the purposes of recreational hunting, vermin and vertebrate animal control.

Effective until ........ / ........ / 20......... Or until I advise it is revoked. (Cross out whichever not applicable)

Conditions of permission (if applicable)
................................................................................................................................................................................................

This permission may be withdrawn at any time by any means by me or any person authorised by me.

Name of Landowner/Manager ........................................................................................................................................
Address ..................................................................................................................................................................................
Signature ........................................................................ Contact Number ....................................................................

Waiver and Indemnity

Listed below is a copy of the Waiver of Liability signed by all property hunters and anyone else who wishes to have access to the property, including guests.

In consideration of being permitted by ...........................................................................................(landowner)
to have access to .......................................................... (property) at ..................................(location of property)
for the purpose of hunting game ............................................................. (or whatever activity is appropriate) on it,
I .................................................................................................... (name of authorised person) for myself, my executors,
administrators and assigns undertake that I hold all statutory authorisations necessary for me to be able to undertake that activity lawfully and I likewise waive any claim, right or cause of action which I might have or but for this waiver otherwise have had to recover from ...................................................... (the landowner) their executors, administrators or assigns damages for injury or loss suffered by me in the course of .................................................. (here repeat the activity) on the said property or otherwise acting upon the said permission and I likewise undertake to indemnify ........................................ (landowner) their executors, administrators and assigns and at all future times to keep each of them indemnified against all suits, actions, causes of action and other claims or proceedings of whatsoever nature, whomsoever made and howsoever arising, whether as a consequence of negligence or otherwise, out of or in consequence of negligence or otherwise, out of or in consequence of my .................................................. (here repeat activity) on the property or otherwise acting on the permission aforesaid.

Date ................................

Signature or permittee .......................................................................................................................

Signature of witness ( if available ) ..............................................................................................................

Name and Address of witness ..............................................................................................................................
<table>
<thead>
<tr>
<th>Date</th>
<th>Hunters Name</th>
<th>No. hours hunted</th>
<th>Bennetts wallaby</th>
<th>Rufous wallaby</th>
<th>Brushtail possum</th>
<th>feral cat</th>
<th>Rabbit</th>
<th>Comments (day or night shooting)</th>
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<tr>
<td></td>
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<td></td>
<td>Seen</td>
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<td>Harv'ed</td>
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Please ensure that when completing the ‘seen’ column for a species, that all animals are counted, including those that have been harvested (e.g. 30 possums seem of which 13 were harvested.)
Background

In Tasmania, Bennett’s wallaby, Tasmanian pademelon (rufous wallaby) and brushtail possums have been at historically high populations since the 90s. These significant increases have occurred State-wide leading to the current situation where these native animals are considered significant economic pests on many farms due to the high levels of pasture and crop losses being experienced by primary producers.

A survey has shown 74% of landholders thought that managing browsing animal impacts was very important and a further 24% thought it was important in the property management. An overwhelming 98% said that browsing animal damage currently affects total farm income through productivity loss.

However, the same survey identified many of the current approaches to wildlife management on farms as being ad hoc, reactive, and in many cases ineffective. The primary control tool used in Tasmania is shooting, and yet only 12% of landowners who undertake shooting indicate that it is a satisfactory control, with 67% finding it only somewhat satisfactory and 21% finding it not at all satisfactory.

In a study on landholder attitudes funded by Alternatives to 1080 Program, an overwhelming 98% of respondents believed that wildlife browsing affected their total farm income through productivity loss, with the average percentage reduction in farm productivity estimated at just over 22%. Concerns were also raised that the current control options available are not sufficient in controlling these losses.

The perceptions of wildlife browsing impacting on farming activity has also been supported by research undertaken by the Tasmanian Institute of Agricultural Research (TIAR) in the north of the state with results showing that landholders are losing between 12% and 100% of new pasture growth on rested paddocks, with the average being around 65% in the first 100 metres from bush edge, which is substantial considering approximately 25% of Tasmania is in this ‘high browse’ zone.

Another study in the Midlands reported losses as far out as 800 metres, which is as far as exclosures were placed from the bush edge. Indeed, landholders may actually be under-estimating their losses to wildlife.

Whilst many landholders blame the reduction in 1080 poison usage for the increase in wildlife numbers on their farms, DPIWPE annual spotlight surveys clearly show that there was an increase in wallaby and brushtail possum numbers across Tasmania starting in the mid 1980s peaking in the mid 1990s and since then the numbers have remained fairly constant, albeit at a higher level than in the late 1970s when monitoring began.

As can be seen in Figure 1 below, by the time the Tasmanian Government started moves to reduce 1080 poison usage in 1999/00 our wildlife population had already been at record levels for around six years.

The more likely reason for animal increases is the end of commercial harvesting and snaring combined with favourable habitat changes. Tasmania consists of a mosaic of vegetation and agricultural landscapes providing favourable habitat for browsing wildlife (food, water and shelter). The clearing of vegetation to make way for improved pasture and cropping, and the increase in water storages on farms has undoubtedly allowed these populations to quickly increase and spread.

With this said, the issue facing most landholders in Tasmania today is that they are managing a parcel of land that is supporting very high densities of native animals. The native animals are directly, and effectively, competing with domestic livestock for pasture, reducing crop yields and making it very challenging and costly to establish forestry, which combined with the restrictions placed on 1080 poison usage, increasing controls on firearm usage, reducing numbers of shooters, an ageing population of shooters and quite significant cost increases for fencing materials, this all leads to landholders having a larger problem to manage but fewer control tools with which to manage the problem.

![Figure 1: DPIWPE annual spotlight ‘encounter index’ for the three target species compared to 1080 usage for wallaby control.](image-url)