



Rabbits: monitoring rabbit populations

Tim Bloomfield (Attwood)

June 1999

LC0334

ISSN 1329-833X

This Landcare Note gives advice on techniques for monitoring rabbits

Monitoring

“Monitoring is simply having a look at what is happening with the rabbit population in a standardised repeatable way and recording what is found for your immediate action and for those who may follow you.”

- Monitoring is the difference between knowing what you have got and just guessing
- You can beat the rabbit but to do so you must know what the rabbit is doing on your land
- Better decisions come from having good quality information
- Quality information can be collected by monitoring rabbits on your land, in your district, and in your catchment

Benefits of monitoring

Individuals, Rabbit Action Groups and Landcare groups can benefit from being able to demonstrate with quantitative and qualitative data, the extent of their rabbit problem. The ability to demonstrate success of rabbit control, actual or proposed to state or federal funding bodies may assist with resourcing future on-ground rabbit control.

Monitoring creates action

Monitoring is an on-going requirement, not something that is just done at the start and end of a program

Immediate action keeps areas rabbit free. The bigger the gap; be it weeks, months or years, between the monitoring of rabbit populations and action, the more rabbits you will have, the more damage there will be and the greater the cost of control.

Record what you find: map the area

Get an aerial photo or plan of your property/area
Map your paddocks/land areas and identify:

- rabbit feeding areas
- rabbit prone soils

- areas of wildlife congregation
- rocky areas
- warrens/burrows (size and number)
- “rippable” warrens /burrows (ie. able to rip. year 1, year 2, etc.)
- steep areas, unsuited to ripping with machinery
- rivers, streams
- above ground surface harbour (type of , area of)
- above ground surface harbour that is removable – indicate Year 1, Year 2 etc
- spotlight transect route (where it is / where it will go)
- areas of high, medium, low rabbit infestation
- show any rabbit free areas
- boundary fences (rabbit proof /not rabbit proof)

Types of rabbit monitoring

There are a number of different types of monitoring that can be used by land managers. The common and simple methods are spotlight transects, warren monitoring, warren/rabbit counts, and the Gibb and McLean Scales.

Spotlight transect counts

Spotlight transect counts give a good indication of the general numbers and density of rabbits across the spotlighted area. Spotlight transects can only ever provide an index of changes in rabbit numbers and are not a measure of absolute population levels in an area.

A spotlight transect is a particularly useful tool when used to monitor general pest animal declines, caused by poisoning campaigns or disease outbreaks.

Spotlight variations

Variations have been measured in the range of 40% in individual spotlight counts. Spotlight counts must be done on at least two consecutive nights and if there is a variation of greater than 10 %, the count should be repeated. Results are variable because of weather, changes in vegetative cover and differences in spotlighting techniques by different operators.

What is a spotlight transect?

A spotlight transect is a route through a rabbit prone area. This area needs to be representative of soils types, topography and land use where rabbits are prone; are likely to be, and /or have been in the past. The route must be trafficable at all times of the year and from which an observer can see and count rabbits at night with the aid of a spotlight. Transects can be made on foot, with a utility, 4WD or four-wheel motor bike as is appropriate for the terrain.

What are the criteria for a spotlight transect?

1. representative of surrounding areas (soils/topographic/climate)
2. representative of the type of rabbit problems over a significant part of your district/region/geographic zone
3. transect length: 2 km for each 100 hectares (minimum 10 square km for a district)
4. transect traversable in all seasons
5. transect can be completed in 4-5 hr or less
6. transect route passes through main rabbit feeding areas
7. transect adjoins warren monitor (active/non-active entrance counts) and/or warren/rabbit count sites
8. historic transect data exists, to compare with new data

What equipment and personnel are needed?

- 100w spotlight
- a vehicle suitable for observation (open tray 4WD, but not from the front seat, stand in the back with an appropriate safety harness!)
- a driver familiar with the terrain, who can also act as the recorder
- an observer to count rabbits, and operate the spotlight

How is a spotlight transect set up?

- select the transect route according to the selection criteria
- travel the transect in daylight to check you can do it in the dark
- break the transect up into 0.5 km segments
- mark the entire transect on a map
- peg/mark the transect at ground level
- set markers beside the transect route 50 metres either side of the transect
- GPS the transect in, marking the 0.5 km sections of the route if possible

When do you do a spotlight transect?

- every four months (minimum), monthly is better, more often in breeding seasons
- at anytime of the month (although best to avoid the bright conditions one week either side of a full moon)
- immediately after the last one, transects must be consecutive

- a variation of greater than 10% from a transect will require another transect to be done
- in stable environmental conditions, or at least on similar nights (but never in rain or drizzle)

How do you do a spotlight transect

- on the transect route count all rabbits and other relevant species
- count only within a predetermined distance (50 metres either side of the transect)
- record the number of rabbits (specifying ages as required and any other relevant species) every 0.5 km
- travel at the speed that allows the observer to count, 8-12 km/h
- always use the same spotlight type (size/watts)
- always use the same vehicle
- always use the same observer to count
- travel the transect in the same direction
- only count. Do not shoot on the same evenings. Do not shoot even 2 days prior

Warren monitor site counts: Active/non-active entrances

This method is simply counting how many burrows are active or non-active over the monitoring period. Warren monitoring overcomes some deficiencies of the spotlight transects and so provides valuable back up data to spotlight counts. Warren monitoring is an accurate way of gaining information on changes in the density of active and non-active burrow entrances per hectare.

What is an active entrance?

The term active entrance means that a rabbit is believed to have used that burrow when you checked it on the day of checking.

What is the relationship between active entrance and rabbits numbers?

The basic approximation for a warren system is that for each three active entrances there is one rabbit.

What else does a warren monitor site do for you?

This method also provides information on the number of warrens per hectare, which is an indicator of the potential rabbit carrying capacity of a site.

What is a warren monitor site and how many do you need?

- an area of 1-5 hectares that contains about 30 warrens down to a minimum of 5 warrens
- each warren has a minimum of 3 burrows
- 7-10 warren monitor sites of 1-5 ha set along and/or beside the spotlight transect

Can a ripped warren be used?

- yes, these can provide evidence of rabbits recolonising sites

- ripped warrens also show the effect of your control methods (ie. D6 dozer vs Kato vs D9)

How is a warren monitor site set up?

- select** a site that has an area of 1-5 hectares that is representative of the general topography and land management of the area, which has a minimum of 5 and up to +/- 30 warrens
- name** the warren (eg. site 1 warren 1)
- record** position & site details of the warren on a map of the area (1:25000) & on a data sheets
- mark the warren:-** place a star picket in the middle of the warren
- write** on a cattle tag (or similar) the warren/site details and secure it to the star picket
- measure** the warren size (**pace** to the outer edge of the warren in 4 segments divided into north / south / east / west eg. north 10 paces, south 8, east 7, west 2)
- count** the number of rabbit burrows that are being used (**active entrances**) and the number not being used at this moment (**non-active entrances**)
- record** the number of active and non active entrances which you have counted
- GPS:** use a geographic positioning system to accurately record data collected if possible
- review, analyse and discuss data**

Warren/rabbit counts

The technique involves counting of rabbits that have emerged from warrens. Provided that counts are done in a consistent manner under similar weather conditions, you can expect less variation than with spotlight transect counts.

This method gives better appreciation of the age of rabbits on each warren (small kittens, sub-adults, and adults) and the occurrence of localised disease outbreaks (RCD or myxomatosis). Observation must be made of a number of warrens in the same land type as well as observations across the variety of land types and land classes in the rabbit infested areas to get an idea of rabbit numbers. Disease outbreaks and the start of breeding season can be picked up with this method.

Farmers, Landcare groups, conservation groups

Farmers, landcare groups, conservation-based groups, and other interested people are encouraged to conduct these counts on their land. The information gained can help produce a regional/catchment assessment of rabbit numbers.

Warren/rabbit count - the method

The method is simply counting the rabbits, which emerge from a warren at a specific time for example, 2 hours before dusk. An observer watches and counts the numbers of adult, sub-adult and juvenile rabbits that appear on a warren or a number of warrens over a fixed time period. This is done from an elevated and concealed observation

position. The number of warrens chosen depends on the availability and the number of observers. Generally, only rabbits on one or two warrens can be counted during the peak activity period.

Note: - this method may not give reliable estimates of the number of very young rabbits in a warren. Young rabbits emerge from the burrow from 21 days of age. Young rabbits behave more timidly than adults and may be harder to observe.

Counts need to be on a monthly basis because pregnant does can drop a new litter of rabbits every month. Sub-adults generally disperse from the warren at 1-2 months of age.

Choosing a warren

A warren should be chosen based on the following criteria:

- select warrens that are representative of the land type/land class
- rabbits can exhibit normal behaviour and activities with no effect from the observer
- differentiation between adults, sub-adults and kittens is possible
- 2 or more warrens can be observed
- any rabbit control (poisoning, fumigating, ferreting, shooting) in the area of the monitored warrens can be noted
- warrens where no rabbit control is planned can be included in the monitor program

When to count?

Counting of the rabbits on a warren needs to coincide with the peak activity of the warren. This is when most rabbits are moving out of the warren for a feed. The peak in activity is likely to be 2 hours before sunset.

If vegetation is short the greatest number of rabbits is usually seen in the last hour before dark. To determine this, observations are required over a couple of days during the mid-afternoon to dusk period.

The peak activity should occur approximately the same time before dusk each day, so long as there has been "normal" seasonal weather conditions and no disturbance of the warren.

Setting up a warren/rabbit count site

- establish** an observation point
- name** the warren site
- record** warren site on map
- record** the dimension of the warren count area
- GPS** warren site
- be able to** observe 2 or more warrens
- ensure access** to observation point does not disturb rabbits or wait until rabbits have settled
- observations** of rabbit behaviour can be made
- easily visible:** warren surface (including entrances) and surrounding area are visible

10. **check that** the warren boundary is clearly identifiable from the observation site

How to count?

- count at the determined peak activity time
- every 15 minutes count the number of rabbits on the warren
- peak activity is when most rabbits are counted per period.

or

- observe the warren at the same time before dusk without determining peak activity for approximately 45 minutes (ie. 2 hours before dusk)

and for both methods

- standard data sheets can be obtained from NRE offices
- record the weather conditions (temperature, wind direction/speed, precipitation)
- record time, date, observers present, name of counter and recorder
- do two, three or more counts consecutively, note variations
- each month do a warren/rabbit count

Remember: - use the same method for the same warren systems and note if changes to the counting method are being used. Combine this method with spotlight and active entrance counts for a more accurate assessment of rabbit populations.

Binoculars can be used to improve visibility (use same magnification & field of view, each time).

What to count?

- number of juveniles, sub-adults and adults
- predator presence

Weather conditions

The activity and emergence of rabbits from warrens varies with weather (temperature, wind, rain, snow), time of day (light intensity, phase of moon and activity phase of the rabbit) and the season (weather, vegetation condition, breeding activity). Emergence times and behaviour vary on a local scale. If weather conditions are unseasonable such as strong winds, heavy rain, unusual or extreme temperatures, remember to record these changes.

Important points:

- Always use the same observer for each observation point.
- Always use the same approach route to the observation point
- Always arrive at the time relative to the start of your count.
- Always allow 30 minutes after arriving at the observation site to allow the rabbits to return to normal behaviour.
- Always record any disturbance to the site.

- Always notify the land manager at least one day prior to the counts to be aware of any potential disturbance to the site during the day of the count or before the count.

The Gibb and McLean Scales

The Gibb and McLean methods can be used as indicators of relative rabbit abundance. Both these methods of estimating the presence of rabbits tend to be subjective and can have significant observer bias. These methods are usually done on foot.

Using Gibb and McLean

The use of photographs to show graphically the levels on the Gibb scale and/or training days for both scales are recommended. The manner in which the scales will be interpreted should be agreed to if more than one person is conducting the surveys in your area.

How do use to the scales?

To use the scales: - have a copy of the scale(s) in a weatherproof plastic pocket, a clipboard or note pad, pen.

Then: -

1. decide the scale to be used:-
 - Gibb is a scale of sign (droppings/faeces)
 - McLean is a scale of sign (rabbit numbers)
 2. define the area to be assessed
 3. set up a transect route across the site
 4. walk the route, at steady pace
 5. consistently use the same route/same observer
- or
1. simply walk the site
 2. record observations
 3. remember the fewer variables of route; observer; weather; and vegetation cover the more consistent the results.

The Gibb scale (1-10)

1. Very few droppings, sometimes grouped, overlooked
2. Very infrequent heaps; little if any scatter
3. Frequent heaps; very light & patchy scatter
4. Frequent heaps; light & patchy scatter
5. Heaps occasionally within 5 paces of each other; moderate scatter almost over whole area
6. Heaps often within five paces of each other; moderate scatter over whole area
7. Usually two or three heaps within five paces of each other; dense scatter
8. Usually two or three heaps within five paces of each other; dense scatter over whole area
9. Some heaps almost merging; scatter very dense
10. Some heaps merging; very dense overall

McLean scale (1-10)

1. No rabbits or sign seen
2. No rabbits seen but some sign noticeable
3. Odd rabbits seen; sign and some dunghills showing
4. Pockets of rabbits; sign fresh burrows very noticeable
5. Infestation spreading out from heavy pockets
6. Infestation over whole area and increasing
7. Infestation heavy, rabbits moving in droves, pasture damage, numerous warrens
8. Infestation at a high level throughout, severe pasture and vegetation change
9. Infestation almost at peak
10. Maximum level, rabbits must spread out over wide area or starve

Both scales are from Coman (1994)

Integrated monitoring

Combine the monitoring methods, warren counts; Gibb; McLean; spotlight; and active entrance counts for a more accurate assessment of rabbit populations.

Remember that rabbit monitoring is your responsibility.

Reference

Coman B.J (1994) *District Rabbit Control A Revised Booklet on the Practical Aspects of Rabbit Control with Particular Emphasis on the Concept of Group Action*

This publication may be of assistance to you but the State of Victoria and its employees do not guarantee that the publication is without flaw of any kind or is wholly appropriate for your particular purposes and therefore disclaims all liability for any error, loss or other consequence which may arise from you relying on any information in this publication.