



Introduction

The aim of this guide is to outline how a night time census is carried out and how the results might be used. The Census Introduction guide should be regarded as companion reading, this guide also links to the Cull Planning guide.

Night Census

Like any other “direct” method of census not all of the deer present will be counted at night, the most valuable figure obtained is the minimum number of deer that must have been present.

Night time census methods have the advantage that they count deer that may not be visible during the day. Deer can be counted from a vantage point, on foot or from a vehicle. Vehicle based counts cover very large areas quite quickly which means that with care the double counting that could result from a census spanning a number of days is eliminated. There are many ways of arriving at estimates of deer numbers apart from night counts. Wherever possible results from night counts should be considered with results from other methods, each hopefully adding confidence to the other.

The method described below describes using a vehicle and is relevant to spotlighting, using image intensifiers and thermal imaging.

Organising a night count

The principle is very simple, the camera/light is carried on top of a vehicle, each time deer are seen the vehicle stops, the sighting is recorded and the vehicle moves on. When organising such a count there are a number of things that have to be considered:

Before the count

- ◆ It is sensible to arrange for alternate dates to account for weather, equipment failure etc
- ◆ The camera/light user must be familiar with the equipment and practiced at recognising deer while using it.
- ◆ A coordinator should ensure that:
 - ◇ A risk assessment has been carried out and recorded
 - ◇ All participants are aware of the objectives of the count,
 - ◇ Equipment is available /functioning
 - ◇ Results can be recorded and disseminated
- ◆ Equipment required:
 - ◇ Vehicle, usually a pick-up with a safety cage that will allow the camera/light to be operated safely while the vehicle is moving
 - ◇ Camera/light and operator
 - ◇ GPS receiver capable of recording track and waypoint

- ◆ Recording form and writing equipment
- ◆ Repeater monitor for truck cab (desirable but not essential)
- ◆ The driver(s) must know the area intimately both from a health and safety point of view and to follow a route that gives full coverage but avoids counting the same deer twice.
- ◆ The minimum number of people involved is 2 but if the count will take a long time or if extra data is required for TI counts, then in addition to the driver and camera/light operator it helps to have a second person on top of the vehicle and a recorder sitting with the driver. It is useful if the crew can switch places from time to time during long nights.
- ◆ Map the route and preferably drive it during the day. This should help to ensure that the planned track is safe and that the likelihood of driving deer ahead of the vehicle or double counting is avoided. The area that can be covered in a 3-5 hour night is around 20 square kilometres (2,000 hectares or 5,000 acres) where access is good. Ideally it should be possible to repeat the route if future counts are required.
- ◆ The best time to carry out night counts is when the natural vegetation and crops are low. At these times of year it can be very cold for the crew on top of the vehicle.
- ◆ Because the distances covered may be large there are often a number of different landowners involved. Often individual landowners prefer to use observers/drivers who are known to them. Access to private land must be agreed. There may be an element of confidentiality to the results, all participants should be aware of this.
- ◆ Always inform the Police and any other relevant persons when a night time census is to take place.

During the count

- ◆ Speed should be slow enough for area to be scanned thoroughly and not cause a risk of injury to the camera/light user, particularly on uneven terrain or rough tracks.
- ◆ Crew must keep a watch for dangerous ground and overhanging branches.

- ◆ Provided deer in the area have not become shy of vehicles at night the vehicle headlights can be kept on. Where necessary either sidelights or no lights may be appropriate but this will slow progress and extreme care must be taken to stick to safe routes.
- ◆ At each sighting of deer the vehicle stops, details of deer, name of location and GPS waypoint are recorded. If driving in public places avoid pointing the camera/light at people, houses and vehicles.
- ◆ Drive the planned route as far as possible. Disregard any deer that could possibly have been counted twice.

After the count

The coordinator should make sure that all paperwork is retrieved and any double counts eliminated. It should be possible to give a brief account of results before everyone leaves, giving due regard to confidentiality.

The kind of results that might typically be issued later are:

- ◆ Brief description of count and any mitigating factors such as weather, location/movement of domestic livestock, cropping patterns, other difficulties.
- ◆ Map (with key) of surveyed area showing track taken, where deer seen and numbers (unless confidential).
- ◆ Minimum total numbers seen (corrected for double counts).
- ◆ Overall male:female ratio (if possible)
- ◆ Overall female:young ratio and estimate for minimum annual increment (if possible).
- ◆ Graph illustrating comparison with previous counts.

Thermal imaging (TI) camera

The TI camera picks up heat signatures rather than light so it can see in true darkness, there are no spotlights or lamps of any kind and the range of the camera (between 1-5 kilometres depending on the equipment) is such that disturbance to the deer is minimised.

Deer show up as very bright figures. With experience it is possible to differentiate between species at distance and the sex of animals if they are closer, although, for the most part, results are given in terms of how many animals are seen in total.

The camera sees in “line of sight” so cannot see through solid objects but it is possible to locate deer in wooded areas more easily than one could with binoculars in daylight or when using a spotlight or image intensifier. The method is easiest to use on open ground. Under tree cover, progress is much slower, a lower proportion of the deer present will be seen, and statistical analysis may be required.

The clearest pictures are obtained in cooler conditions but the camera is capable of good images on warmer nights and in rain and mist.

If additional information on the position of deer seen is collected, TI count data can be input to a statistical analysis package called “Distance” which enables an analysis that can estimate the true total of deer present including those not seen. This is most useful in woodlands. Unfortunately, collecting the additional information slows the survey down considerably, usually a simple minimum numbers count is adequate on open ground.

A TI camera is an expensive and specialist piece of equipment and requires an experienced user. See Further Info below.

Spotlighting

Spotlighting is carried out in essentially the same way as thermal imaging but does not require expensive, specialist equipment. A lamp and binoculars are required if using visible light. White light is easiest for the human eye but filtered lamps may be less visible to deer. Spotlighting is far more noticeable than thermal imaging and more consideration may have to be given to public concern and disturbance to game shoots and livestock. Where deer are regularly disturbed by lamps at night they may become “lamp shy” and may leave open areas before they can be seen.

Image intensifiers

These rely on ambient light (e.g. moon or starlight) or an infra-red lamp. Often optical quality is not good but they can be useful for short range observations. Deer do not contrast with their background nearly as clearly as with a TI camera.

Reducing potential errors

There are a number of ways of avoiding sources of potential error:

- ◆ equipment user must be trained.
- ◆ any animals not positively identified as deer must be discounted e.g. it may be necessary to ground truth in daylight any “deer” seen at long distance, they may turn out to be domestic livestock.
- ◆ the crew should develop a sound method of recording that eliminates misunderstanding.
- ◆ as far as possible hold the count in conditions when deer are likely to be seen.
- ◆ eliminate all possible double counts (local knowledge is essential).
- ◆ Where possible, repeat counts for greater accuracy.
- ◆ use same method on repeat counts or allow for changes e.g. to area surveyed.
- ◆ as far as possible include as much of the deer range as possible in the count area, especially important with herding species.
- ◆ Warmer, overcast nights with a breeze may produce better results than cold, clear, still nights.

Further info

Mayle, B.A., Peace, A.J. & Gill, R.M.A. (1999).

How many deer? A field guide to estimating deer populations. Forestry Commission Fieldbook 18.

For more information on the use of thermal imaging equipment contact the Deer Initiative www.thedeerinitiative.co.uk