

Use of Drones 2 (UAV's)

In Deer Management

The aim of this guide is to explain how drones can be effectively and responsibly used in deer management by outlining counting methods, operational constraints, wildlife considerations and legal requirements to ensure surveys are accurate, safe and compliant.

Drones are a useful tool to assess deer numbers on any type of land but this will be dictated by the scale of area that is to be surveyed.

Minimum count

- Assessing deer numbers on agricultural land or deer present in woodland blocks.
- Planning a days stalk.
- A quick method that can be carried out efficiently with trained onsite staff.

Plot based count (or minimum count over bigger area, multiple days)

- Using plots or strips to estimate deer population size for a wider area.
- Suitable for larger areas.
- Useful to plan seasons cull or assist in developing population models.
- More complex and better suited for professional contractors to carry out who specialise in deer.
- Undercounting can be avoided by overlapping circular based counting plots, just mark deer groups carefully to avoid over-counting.

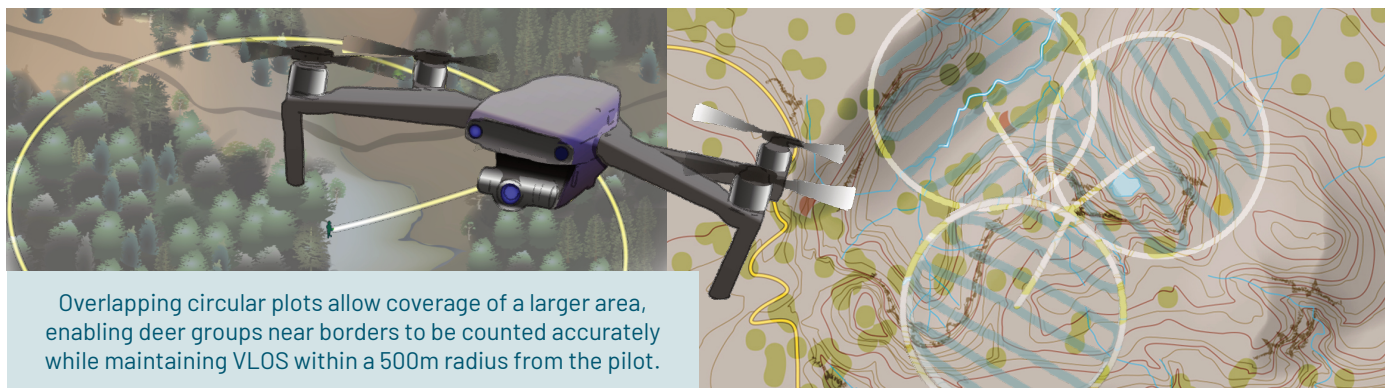
The effectiveness of counting or locating deer in a given area can be increased through the use of drones especially when equipped with thermal imagery (TI) sensors. Certain models of commercial drones are equipped with three lenses (TI, wide angle and zoom lens) which, when combined, provides accurate detection and identification of heat sources. The combination of all three cameras enables the user to locate, identify and capture images or videos of deer and other wildlife. These technologies can be applied by the drone operator and used as part of a wider deer census survey, or to assist in culling operations by locating deer and/or carcasses.

Advantages

- Quickly and efficiently cover large areas of land (500-2,000 hectare per day depending on habitat structure, drone type and battery availability).
- Capture high-quality, geo-referenced imagery where the operator may be able to determine the number, species, sex and age breakdown of deer (which classification would be limited at night).
- Minimal impact and disturbance on wildlife.
- Reduced CO2 footprint and manpower when compared with traditional terrestrial methods of counting or locating deer.
- Can count deer in semi-closed woodland.

Constraints

- Weather conditions such as bright sunshine, warm temperatures, fog, wind, rain and surface water can limit the drone's capabilities and the effectiveness of thermal detection compromising safe operation.



Overlapping circular plots allow coverage of a larger area, enabling deer groups near borders to be counted accurately while maintaining VLOS within a 500m radius from the pilot.

- Covering large ground with overlapping plots can push deer and result in double counting.
- Thermal sensors are often unable to detect deer under thick conifer plantations or dense broadleaf woodland outside of winter months.
- Flight time is limited to approximately 20-50 minutes per battery set depending on ambient temperature, weather conditions and the model of the drone.
- Accuracy for large scale counting still not quantified (unless undertaken by professionals) and caution is advised when developing management plans or cull models.

- 1 Drones are not permitted to operate in restricted airspace (Flight Restriction Zones, FRZ) such as prisons or military areas unless prior authorisation is granted. Note that some areas can become restricted airspace temporarily.
- 1 All commercial drone flights require valid insurance cover.
- 1 Scale of flight mission restricted by CAA regulations.

Most efficient when

- Some weather conditions maximise thermal detection and drone capabilities. Ideally, these are colder temperatures, low wind speeds, and minimal precipitation.
- Habitat that is open terrain, broadleaf woodland that has shed its leaves, or well-spaced conifer trees.
- The drone is being operated during the hours when deer activity and movements are at their highest i.e. dawn and dusk.
- There are sufficient sets of batteries and/or drone operators to thoroughly cover an area in the shortest possible time to reduce the likelihood of under counting or double counting deer.

Wildlife disturbance

When flying a drone from any category, the operator must ensure wildlife are not disturbed or their welfare compromised. Wind direction can have an impact on how audible the drone is and will change how quickly animals will react to its presence. While inaudible to humans, the frequency of a drone can disturb certain species and be a stress factor to wildlife. Laws are in place which protect wild animals from disturbance and harassment.

For most species, the Wildlife and Countryside Act 1981 and the Habitats Regulations apply.

- 1 Check with the landowner in advance, if the planned flight area is within a designated site such as a SSSI, and be aware of nesting birds, particularly where Schedule 1 & 1A birds are present.

Impact on Deer

Behavioural responses to drone disturbance includes trotting/galoping away, due to herd behaviour this could result in stampeding away from the drone or fragment herds, separating females from dependants. Individuals may suffer stress that could disrupt their reproductive success depending on the time of year. Females may abandon young or decide to avoid specific areas because of frequent drone encounters and more subtle impacts such as a reduction in feeding rates can also be a result of disturbance.

- 2 Drones should be flown at a height which does not influence the behaviour of the deer below, if a change of behaviour is witnessed then the drone operator should immediately adjust the flight height or consider moving away from the animals to reduce stress.

- 2 If moving of deer by a drone is required, then the operator must constantly monitor the deer for early signs of distress.

- 1 If moving deer by drone is required (for counting or to clear them from an area), then the operator must constantly monitor the deer for early signs of distress, see BPG - Use of Helicopters: Safeguarding welfare. It is illegal to move deer using a drone with the intention of killing them [Section 19 (1) of the Deer (Scotland Act 1996)].

- * See BPG; Risk Assessment
- ** See BPG; Use of Helicopters
- *** See BPG; Deer Health
- **** NatureScot Statutory Guidance; Driving Deer with Vehicles

Further Reading www.caa.co.uk/drones and notaminfo.com/ukmap.