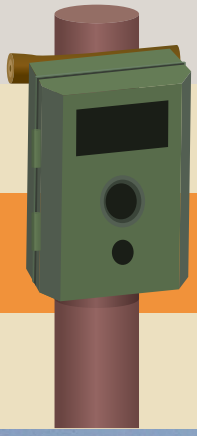
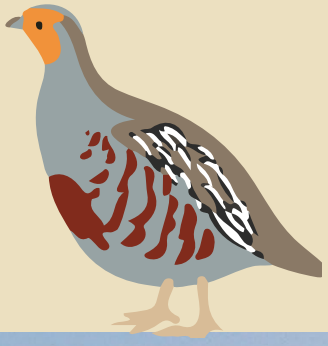


CAMERA TRAPPING



Guidelines for camera trap monitoring at gamebird feeders

A tool for evaluating and optimizing supplementary winter feeding through hoppers

The aim of supplementary winter feeding with gamebird feeders is to increase the winter survival-rate of seed-eating farmland birds and help them improve their body condition for the next breeding season. Best-practice guidelines can maximise the benefit for gamebirds and songbirds, and help to reduce the food taken by pest or 'un-welcome' species. Camera trapping can reveal the different types of wildlife visiting the feeders and allow optimisation of the feeder management. This factsheet provides guidelines on camera trap placement and settings to monitor gamebird feeders.

WHY

Winter weather can pose serious challenges for birds living on modern farmland. Besides an increased lack of habitat cover for protection from harsh weather and predators, scarce seed-food availability (especially during late winter) increases the rate of winter mortality. In addition to habitat measures, which are aimed to provide better winter cover, protection from predators, particularly raptors, and a reliable source of seeds into mid-winter, additional supplementary food provided through feeders throughout winter can increase and extend seed-food availability into early spring. The aim of winter feeding is to increase the winter survival rate of seed-eating farmland birds and help them improve their body condition for the next breeding season.

Best-practice guidelines for supplementary winter feeding have been developed to maximise the benefit for gamebirds and songbirds. These guidelines also help to reduce the amount of food taken by pest or 'un-welcome' species, such as rodents, corvids (e.g., crows and magpies) and pigeons. In this context, camera trapping can provide insight into the use of the feeders by both target and non-target species, and allows for modification of the feeder approach, if necessary. In project areas with no recent history of supplementary feeding, small scale camera trapping can help evaluate the impact of this measure before introducing supplementary winter feeding as a general management tool. This approach allows land managers (1) to detect potential problems early in a project, and (2) to address those problems before embarking on what could turn out to be a detrimental feeding regime.

PROJECT SET-UP

Supplementary winter feeding with gamebird feeders was part of our PARTRIDGE management toolbox. Wherever it was feasible, we provided additional supplementary winter food through feeders at our ten demonstration sites. The time involved in monitoring wildlife visiting feeders using camera traps is not something that should be underestimated. We therefore restricted this type of monitoring to two sites with no recent history of supplementary feeding, and one site where local stakeholders already ran their own winter feeder management for many years. At the latter, camera trap monitoring was used to support the advice on how to implement the best-practice guidelines for feeder management.

A single camera trap can aid in evaluating the correct placement of a specific individual feeder. The use of multiple camera traps, preferably simultaneously, is recommended to assess management of multiple feeders aimed at changing the use of feeders by certain species. This technique can also assess the use of the feeders by target species to help evaluate the added value of feeders for local farmland bird conservation projects.

CAMERA TRAPPING AT GAMEBIRD FEEDERS

To monitor the activity at gamebird feeders, camera traps can be placed near feeders. When animals visit the feeder, the camera is triggered by their movement and a single or a series of photographs are taken. In order to optimise and standardise the data collection, this factsheet provides some guidelines on camera trap placement and settings.

Camera trap placement

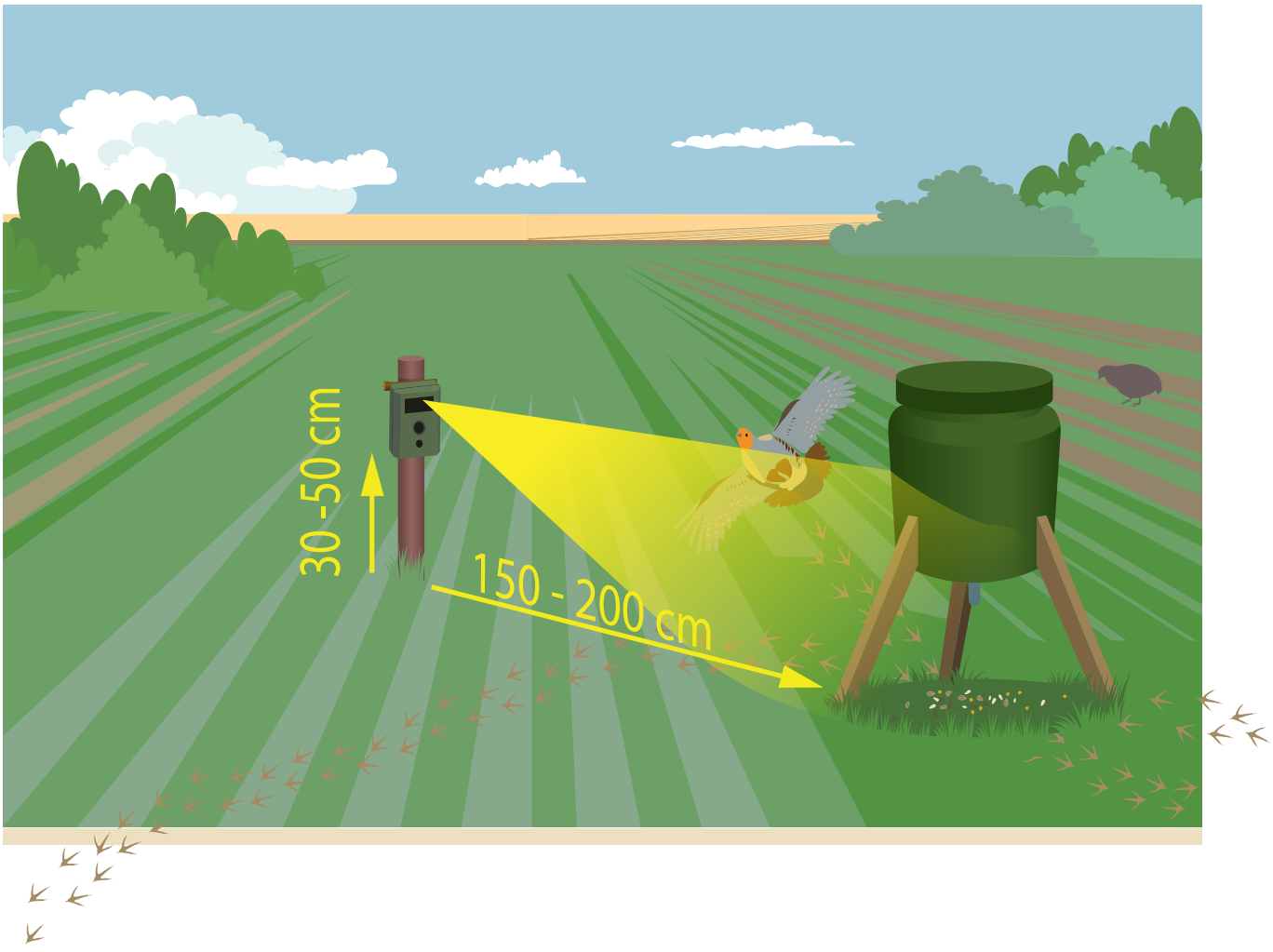
- Set the camera at a distance of 1.5 to 2 meter from the feeder. Do not place the camera too close to the feeder.
- There should be no objects or vegetation between the camera and the feeder. Beware of vegetation that will falsely trigger the camera trap, both in front of and behind the feeder. Use secateurs to prune back vegetation if needed.
- Set the camera at a height of about 30 to 50 cm (knee height). This is important, as camera height is a major determinant of what animals are recorded; smaller species will be missed if the camera is placed too high.
- Place the camera trap parallel to the ground and aim it at the feeder. Attach the camera to a tree or pole. The camera must be aligned parallel to the ground, so that the 'horizon' is in the center of the image. Set the camera as horizontally as possible. This is important since the motion sensor works with detection bands. The image should include the ground 1 m in front of the camera. The viewing angle can be adjusted by sliding sticks between the tree or pole that the camera is attached to and the camera.
- Aim the camera to the north as much as possible in order to avoid false triggers (due to sunrise and sunset) and to obtain better quality pictures. Facing the camera to the north will yield the clearest images during daytime.

- Whenever you insert a memory card into the camera and turn the camera on, this is the start of a deployment. When the camera is turned off and the memory card is removed, this marks the end of the deployment. In case the camera is left at the same location, we recommend using another memory card for the new deployment.

- When setting the camera, trigger the camera to take a picture to set the starting point of the deployment. When collecting the camera or the memory cards, trigger the camera to take a picture (before turning the camera off) to set the end point of the deployment.

- Best-practice guidelines for feeder management recommend moving the feeders regularly to reduce rats becoming established around feeders, and to prevent the spread of diseases and parasites. More specifically, feeders should be moved every seven to ten days, shifting their position in relative proximity to the original location. Since camera traps need to be moved simultaneously, this results in camera deployments of seven to ten monitoring days.

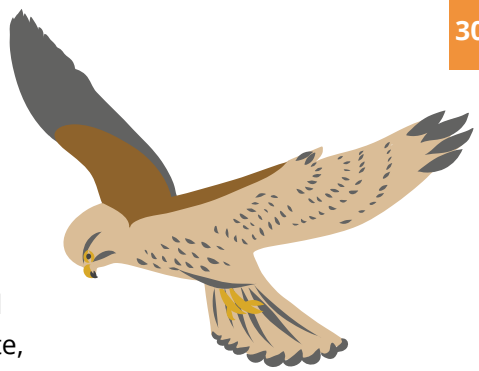
- When using multiple cameras, use camera models with similar features. Camera trap models have evolved rapidly during the last decade with improvements to their capabilities. This includes for example the detection zone, the field of view, sensitivity and trigger speed; all of which affect the resulting photographs and which animals are recorded. If the project aim is to compare different feeder approaches, it is best to use the same camera model. If this is not possible, choosing camera models with similar features will reduce a bias in sampling design.



Camera trap settings

- Each position of a feeder receives a unique identifier. If possible, use this location code in the camera settings (e.g., through a camera label).
- Make sure the date and time are set correctly on the camera. Use the Greenwich Mean Time (GMT) to standardise across countries and neglect Daylight Saving Time. It is important to check these settings after battery replacement.
- To maximize the detection probability, set the cameras to take as many pictures as possible (multiburst), as fast as possible and with as little (no) time delay as possible between triggers. In case too many photos of the same animals are taken, the time-delay can be increased to 15-30 seconds.
- Start with the sensitivity set at high. In case of too many false triggers, reduce the sensitivity to normal.
- If possible, set the camera to take one or two pictures each day at a fixed time (time lapse mode), for example midday and midnight. This allows you to detect failures during the deployment. For example, if the batteries run out of power, the time lapse pictures show the day the camera last functioned.
- Use only cameras equipped with 'no glow' or 'black' LED light arrays. These invisible light arrays will not spook animals visiting the feeders at night.

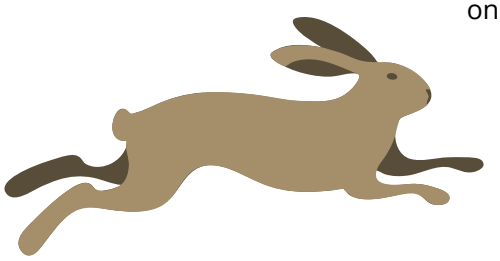
DATA ANALYSIS

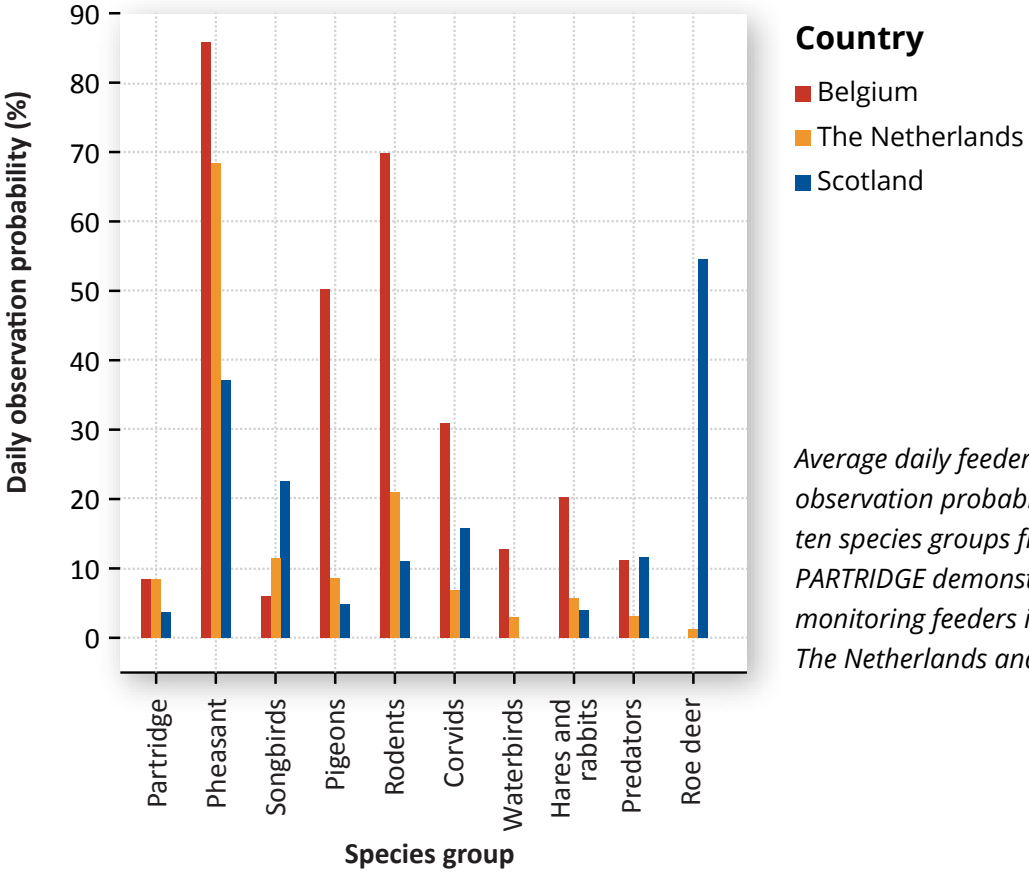


Going through the collected photographs of a single camera trap will already provide insights into the correct placement of a specific feeder. Here, we present a simple approach to analyse the data from camera trapping at feeders in order to obtain a more general indication of their use, and to help evaluate their management. More advanced statistical techniques can be used, for instance to incorporate the observation date, the location of the feeder or other parameters from the data, but these fall outside the scope of this factsheet.

Identifying the species of wildlife in the photographs is a time consuming job. We recommend the use of an easy-to-use application to handle the collected photographs from camera traps (for example Agouti.eu). Not only do these applications automatically record the time and date the photograph was taken (when set correctly in the field), but they also offer a user-friendly platform to identify the animals seen on the photographs and allow you to track the placement of the different camera traps. Nonetheless, if the use of such an application is not feasible, it is sufficient for this analysis to record for each monitoring day which species were seen at the feeder.

Identifying the animals at the species level is not always possible. Where this is not possible, the observations can be identified at the genus or order level. For the ease of interpretation, and depending on the project aims, species can be grouped into categories. For example, in the PARTRIDGE project we grouped animals into 10 categories, namely pheasant, partridge, songbirds, corvids, pigeons, rodents, hares - rabbits, predators, waterbirds, and roe deer.





Average daily feeder use (Daily observation probability) of the ten species groups from the PARTRIDGE demonstration sites monitoring feeders in Belgium, The Netherlands and Scotland.

The comparison of feeder use between different species is further complicated by their behaviour. For example, a species can visit the feeder only once but for a long time, or frequently for short time intervals during a single day. To circumvent these issues, we recommend just recording whether a species visited the feeder during a specific monitoring day.

To get a general indication of feeder use by the different species or groups, calculate the number of days each species or group was recorded at a specific feeder and divide this number by the number of monitoring days at this feeder. The result is a daily observation probability. In case multiple feeders were monitored, calculate the mean of these daily observation probabilities. This value can be used to compare feeder use between species and different groups of feeders.

WORDS OF CAUTION

Stick to the protocol! Deviations from the protocol should be avoided as much as possible, as they can seriously affect data collection. Therefore, it is important to familiarise yourselves with the camera trap and this factsheet. Making mistakes while setting up the camera in the field will have a significant impact on the data collection. A common mistake is the incorrect setting of the date and time. Also, do not delete any photographs from the deployment as even empty pictures can give information on the correct operation of the camera trap.

Be aware that more advanced analyses are required to extrapolate further from data collected through camera trapping. For example, how the use of the feeders by the different species varies throughout the season. More complex analyses can provide information on these sorts of comparisons. For further reading see our PARTRIDGE monitoring report. Nonetheless, the outlined analysis approach is an easy-to-use method to get an indication of feeder use by different species at a managed site.

BACKGROUND

This factsheet provides guidelines for anyone interested in monitoring the effectiveness of gamebird feeders. It is based on the experience accrued during the seven years of the North Sea Region Interreg PARTRIDGE project, where camera trap monitoring was used at three demonstration sites across Belgium, the Netherlands, and Scotland to optimise the use of supplementary winter feeders. For more information visit: PARTRIDGE, Interreg VB North Sea Region Programme.

BACKGROUND LITERATURE

Petersen, F., De Bruyn, L, Scheppers, T., Buner, F., Dumpe, L., Ewald, J., Gottschalk, E., Hubbard, C., Cnuts, M., Devisscher, S., Devos, K., Dhaluin, P., Gelaude, E., Mistiaen, R., Neukermans, A., Onkelinx, T., Oost, F., Oostinga, N., Parish, D., Pijcke, J., Sloothaak, J., T' Jollyn, F., Torrance, F., Van Colen, W., van de Straat, S., Van De Walle, M., Vanhuyse, K., Vercammen, J., Verstraete, H., Verzelen, Y., Vreugdenhill, C., Wackenier, M., & Wieland, A. (2023). PARTRIDGE monitoring: Results from the monitoring programme of the Interreg North Sea Region PARTRIDGE project. Institute of Nature and Forest (INBO). https://doi.org/10.21436/inbor.98449677.

Rovero, F., Zimmermann, F., Berzi, D. & Meek, P. (2013) "Which camera trap type and how many do I need?" A review of camera features and study designs for a range of wildlife research applications. Hystrix, 24, 148–156.

Sánchez-García, C. & Buner, F.D. (2017). Guidelines for successful gamebird and songbird feeding. Game Wildl. Conserv. Trust, 19.

Sánchez-García, C., Buner, F.D. & Aebischer, N.J. (2015). Supplementary winter food for gamebirds through feeders: Which species actually benefit? J. Wildl. Manage., 79, 832–845.

Trolliet, F., Vermeulen, C., Huynen, M.C. & Hambuckers, A. (2014). Use of camera traps for wildlife studies: a review. Biotechnologie, Agronomie, Société et Environnement, 18(3), 446–454.

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