



GREY PARTRIDGE (*Perdix perdix*)



Best practice guidelines for successful grey partridge monitoring on farmland

Line-transect playback method for spring counts

The grey partridge is not only a characteristic species of the agricultural landscape and an important game species across Europe, it is also regarded as an indicator of overall farmland health. Given the large pressures of agricultural intensification on farmland biodiversity over the past decades, clear monitoring guidelines to evaluate conservation efforts and sustainable hunting are now more important than ever. The playback method, detailed in this factsheet, provides a user-friendly and efficient tool for anyone interested in monitoring the trend in local partridge populations on farmland. This factsheet is based on the experience gained during the North Sea Region Interreg PARTRIDGE project.

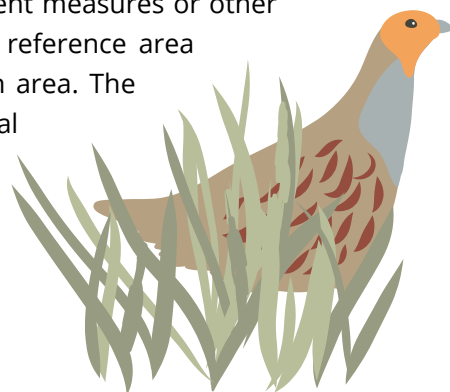
WHY

The grey partridge is not only a characteristic species of the agricultural landscape, but also an important game species across Europe. Labelled as the “barometer of the countryside” the grey partridge is an ideal indicator of farmland ecosystem health: where partridges thrive, biodiversity is high and ecosystem services are intact. However, like many farmland species, agricultural intensification over the past decades has led to rapid declines in grey partridge numbers across Europe. Careful monitoring of the local grey partridge population thus not only serves as a valuable tool to assess their conservation status and sustainable hunting bags, but the health of the local farmland ecosystem and its biodiversity in general.

Moreover, standardised monitoring, such as partridge counting, can help measure the effects of implemented management strategies on local wildlife, for example in farmland restoration or small game conservation projects. It allows farmers and hunters, or any other interested stakeholder group, to optimise future management practices to help achieve maximum success.

PROJECT SET-UP

In the PARTRIDGE project, partridge numbers on demonstration areas were compared to those on paired reference areas. This allowed us to better interpret and detect meaningful trends in abundance. In the case of a similar project, monitoring should be conducted on both demonstration and paired reference areas. Aside from not receiving any of the management measures or other experimental treatments undertaken at the demonstration area, the reference area must be spatially near and agriculturally similar to the demonstration area. The two areas should be 4-6km apart, to avoid movement of individual partridges between the areas, ensuring that the partridge counts remain independent. As the monitoring requires a minimum number of observations to detect any trends, the minimum size of the study areas depends on the density of partridges in the area. For PARTRIDGE, a minimum area of 500ha was used. This technique can be used for other single-site projects but, without a comparison reference area, changes will be more difficult to interpret.



PARTRIDGE SPRING PLAYBACK COUNT

To measure the trend in partridge spring density, the line-transect playback method provides an efficient, user-friendly tool. The playback-call of a male partridge is used to provoke, and subsequently count, the majority of present males along predetermined line transects spread throughout the project area. The use of playback calls is a great tool to increase the detectability of species, such as the grey partridge, who are difficult to observe in the field due to their elusive behaviour or obstructive habitat. Over multiple years, the trend in these counts gives a reliable indication of the changes in grey partridge abundance in the area.

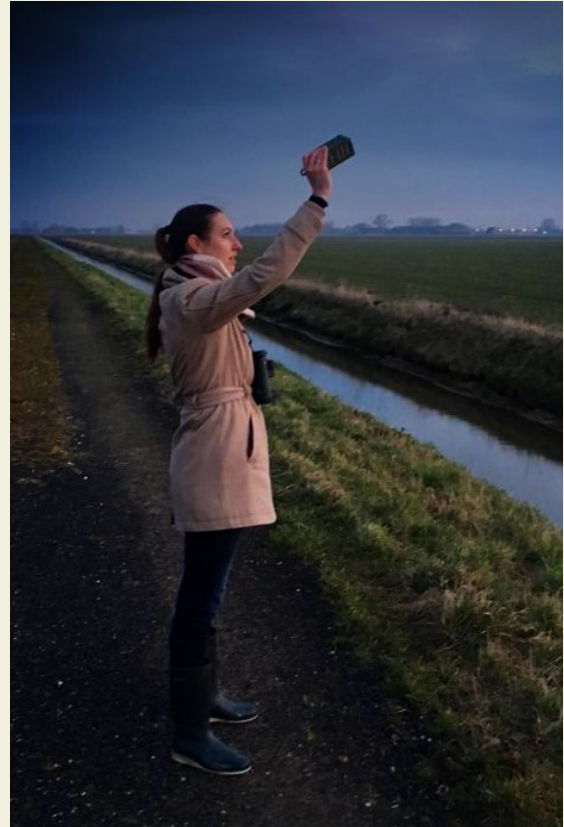
- Counting is conducted between January-March each year, with a minimum of three, preferably four, evening or morning counts per area. As peak calling activity for male partridges occurs when coveys break up, during the time of pair formation, counting sessions should be scheduled accordingly. Pair formation is weather-dependent and can start as early as January during mild winters in some areas. It is advisable to leave at least one, maximum two, weeks in between consecutive counts to minimise disturbance and optimise overall timing of counts.

- Counting is either carried out in the morning, from one hour to 30 minutes before sunrise, or in the evening, from 30 minutes to one hour after sunset. Each session should be limited to 30 minutes. This corresponds to the peak in calling activity during the day. Only one or the other should be used consistently per site, including the reference site if applicable.
- In case of heavy rain, fog, frost, snowfall, or wind (> 3 Beaufort), the counting session should be postponed to the next suitable date, as these unfavourable weather conditions affect visibility and male calling activity and thus affect the precision of the count.
- Line transects are spread throughout the project area at fixed locations. It is recommended to spread the transects evenly across the project area, to ensure that the playback sound can be heard by most partridges present in the area. Ideally, each 1km square should be covered by one 1-km transect.
- Each transect should be between 1 and 1.5km in length. Ensure that this distance can be covered within the 30-minute counting interval.
- Counters are equipped with a portable loudspeaker device on which the sound of a calling male (playback-call) can be played at natural volume. Considering that this volume reaches around 200-300 metres, adjacent transects are preferable more than 500-600m apart to avoid confusing the playback played on parallel transects with the response of male partridges in the field.
- All transects should be walked simultaneously. This requires at least one observer per transect. In case where there are not enough observers to cover all the transects in one session, a combination of an evening session followed by a morning session can be used to cover all transects to limit the partridge movement between transects. However, it is not recommended to use this approach as the norm (see also further above).
- It is advised to alternate the transect starting point between both ends on consecutive counts, as the change in amount of daylight throughout the counting session affects the chance of sightings of males in the field.



Counting session

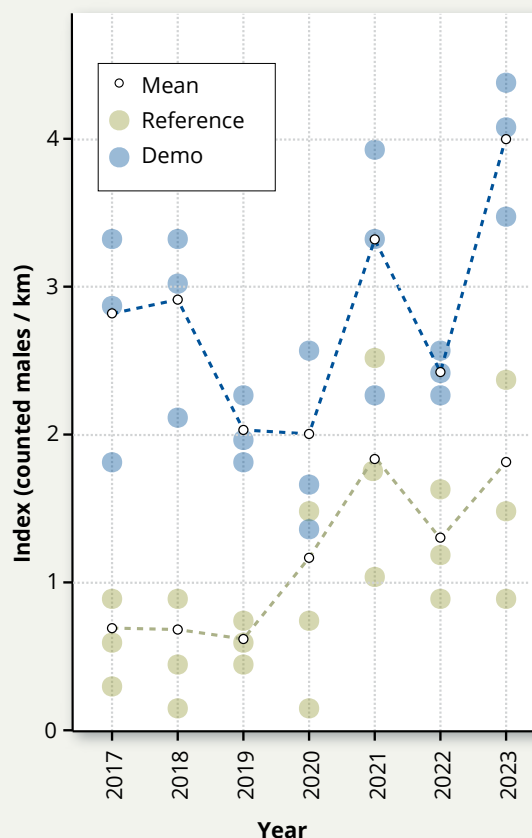
- Appoint one observer per transect. All observers start counting simultaneously on their respective transects and should be provided with a detailed map of the area to facilitate orientation and the marking of observations. At the beginning of each annual counting season, a test run should be undertaken to allow all counters to familiarise themselves with the technique, the counting area and their allocated transect.
- The date, start and end time, weather conditions (% cloudiness, precipitation, wind force, temperature), name of the observers and their respective transect are recorded for each counting session.
- Each transect is split up into 100m intervals. Observers must stop every 100 metres along their transect and play the playback call three times in three directions (right, left and front). After the playback, observers should listen carefully for responding calls from males in the field for 30 seconds. In case of no response, the playback can be played again followed by another 30 seconds of careful listening. In case of a response, the playback-call should be stopped, and the location and timing of the response should be recorded on the map. This step is repeated for every 100 metres along the transect. Counters should be aware that female partridges can call in some cases, although much less frequently than males. The female call is difficult to distinguish from the male call but should be omitted from the count where it is possible to identify it.
- In addition to calling individuals, sightings are also recorded on the map.
- Every observation includes whether the individual(s) was/were seen, heard or both. In case of sightings, the counter should specify the number and type of the individuals seen, being either solitary (one individual), in a pair (two individuals: male and female) or in a covey (two males or more than two individuals).
- At the end of each counting session, all observations are written down on a joint map, allowing for potential double counts to be eliminated.



DATA ANALYSIS

For each counting session, an index (the total number of individual males heard or seen per km) is calculated. This index equals the total number of male partridges counted during that session divided by the total length of all transects in that area combined (in kilometres).

As only male partridges are counted to calculate this index, careful interpretation of the field observations is extremely important and relies on some assumptions. As the timing of counting coincides with the peak in calling activity for male partridges (during pair formation), it is assumed that all calls heard during counting, without sighting, are calling males. Furthermore, solitary individuals seen in the field are always assumed to be male, as greater female mortality from the previous breeding season results in an imbalanced sex ratio in partridge populations in the spring, with a surplus of unpaired males. However, in a covey an equal ratio of male to female partridges is assumed and as such the number of males is estimated as the total number of individuals in the covey, divided by two and rounded up to a whole number.



Every year, a mean index is calculated from the indices calculated per counting session. Graphs of the trend in this index over several years gives a good indication of the trend in grey partridge abundance in early spring in the area and is thus an efficient way of monitoring the trend of the local population.

WORDS OF CAUTION

Stick to the protocol! Deviations from the protocol should be avoided as much as possible, as they can seriously affect the precision of the counts. Therefore, it is important that all participants are aware of the protocol guidelines and comfortable with the implemented techniques before monitoring starts.

Given the number of variables which may affect the response behaviour of partridges to the playback calls, the calculated index should not be presented as an estimate of absolute population density. Moreover, as the index is exclusively based on counted male partridges (always a combination of single and paired males), it must not be equated to the number of pairs or territories present within the area. To obtain an accurate index for spring pair numbers, other counting methods are available. However, over longer time periods, the index does provide a reliable tool to monitor the trend in the local partridge population.



BACKGROUND

This protocol provides an accessible and efficient tool for anyone interested in monitoring local grey partridge numbers. This factsheet is based on the experience accrued during the seven years of the North Sea Region Interreg PARTRIDGE project, where grey partridges (and other species) were monitored at 10 demonstration and 10 reference sites across Belgium, England, Germany, the Netherlands, and Scotland. For more information visit: [PARTRIDGE, Interreg VB North Sea Region Programme](#).

BACKGROUND LITERATURE

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