



# Farmland Breeding Birds Survey Volunteer Handbook

Greater Manchester Ecology Unit

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# Farmland Breeding Birds Survey Volunteer Handbook

## **Carbon Landscape Citizen Science Project**

### *Contact us*

Please contact the Greater Manchester Ecology Unit (GMEU) if you have any questions with regard to this survey handbook.

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# Contents

Introduction.....	4
Survey Preparations.....	5
One kilometre square and site selection .....	5
Submitting your survey data .....	6
Land owner permissions.....	6
Survey timings.....	7
General equipment list .....	7
Health and safety .....	8
Biosecurity .....	8
Farmland Breeding Birds Breeding Evidence Survey.....	9
Background and survey aims.....	9
Useful/essential equipment.....	10
Survey timetable.....	10
Planning your survey route .....	11
Habitat survey.....	11
Field mapping.....	11
Habitat codes.....	13
Boundary habitat surveying .....	13
Breeding farmland birds survey methodology.....	14
Target species .....	14
Weather.....	16
Times.....	16
Bird recording.....	16
Birds in the boundaries.....	18
Breeding evidence codes.....	19
Flocks.....	20

Birds in flight.....	20
Additional Records.....	22
Feedback.....	22
Appendices.....	23
Grid references .....	23
References.....	24

# Introduction

Thank you for volunteering to take part in the Carbon Landscape’s Citizen Science Project to monitor key species through structured surveillance. The project’s boundary, [view map: <https://gmwildlife.org.uk/mapapp/?project=carbonlandscape>] encloses the core of the Great Manchester Wetlands Nature Improvement Area (NIA) which supports a host of European and UK protected species, as well as UK Biodiversity Priority Species, all dependent on the mossland and wetland habitats which the project will enhance and restore.

The project will build on the existing survey work being undertaken and will also recruit and train new recorders, our Citizen Scientists. It aims to significantly increase survey coverage of target species, including farmland birds, across the key habitat restoration areas, and the wider Carbon Landscape. The surveys have been designed with the help of specialist county and vice-county recorders who between them have a wealth of experience in species monitoring in the North-west of England.

The survey methods are structured and repeatable allowing valuable data to be collected, not only during the three year life of this project, but well into the future. Biological datasets are of most value when collected over a long time span. Monitoring the abundance and distribution of the target species is an important mechanism for measuring the success of the habitat works on the ground and changes to the landscape over time. This will be of particular benefit to those owning or managing land within the Carbon Landscape, whilst providing ecologists and conservationists with biological data that can be analysed at landscape scale.

This project will provide important insights into the factors influencing abundance and distribution of some of our key species and most importantly, will be used to support future species conservation work.

Your contribution as a Citizen Scientist to the Carbon Landscape Project is greatly valued.

# Survey Preparations

## One kilometre square and site selection

The Carbon Landscape's Citizen Science Project survey unit is the 1km square and we aim, with your help, to survey as many of these as possible within the Carbon Landscape boundary by the end of June 2020. This will ensure the data collected is statistically robust and enable species distribution to be mapped at a landscape scale.

We have developed an online data portal which enables recorders to request 1km survey squares and view those already allocated, see [gmwildlife.org.uk/carbon\\_landscape/survey\\_squares](http://gmwildlife.org.uk/carbon_landscape/survey_squares). Co-ordinating volunteers' survey effort will enable a large biological dataset to be compiled and ensure coverage is as comprehensive as possible, giving us a clear picture of the distribution of farmland birds at a landscape scale.

## Submitting your survey data

When carrying out your survey, please use the field survey forms provided to ensure you capture everything as required. Your data should ideally be submitted to GMEU as soon as possible after each survey visit. We have developed a data entry portal which will allow you to submit your survey results online. You can access the online survey data entry forms for your allocations here, <https://gmwildlife.org.uk/user/surveys>.

## Land owner permissions

Landowners' permission for access onto private land where there are no public rights of way must be obtained. The Carbon Landscape Programme team are compiling a database of landowners and requesting access to their land. If you are unsure if you have permission to walk on land please check with GMEU before carrying out your surveys. Please pass on to us any information you obtain on landowners and their contact details as these will be added to the database.

You will be issued with a letter (also available to download from our website [gmwildlife.org.uk/carbon\\_landscape/](https://gmwildlife.org.uk/carbon_landscape/)) which briefly explains that you require access to carry out ecological surveys and advising that you request the landowner to contact GMEU should they require additional information. We rely very much on the good will of farmers and landowners and are willing to share survey data with them if they are interested in knowing which species occur on their land with a view to sympathetically managing the habitats under their stewardship.

# Survey timings

The Carbon Landscape Project surveys should be carried out at the specified time of year which varies depending on the target species or taxonomic group. The surveys have been designed so that they can be completed by one or a number of different volunteers over a year. The survey methodologies and dates are based on current national surveys which will allow the direct comparison of the results with national data and trends.

# General equipment list

Some of the surveys require specialist equipment, details of which can be found in the individual survey methodologies, However, there are a number of items that should be taken on every survey, including: -

- Survey route map
- Clipboard, field survey form(s) and pencil
- Notebook
- Waterproof clothing
- Sturdy walking boots
- First aid kit
- Food and drink (if required)
- Hat and suntan lotion (strongly recommended from April to September, even during cloudy conditions)
- Whistle
- Camera
- Mobile phone, in case of emergency (do not rely on smart phones for navigation)
- Warm clothing (if required)
- Insect repellent (if required)

## Optional equipment

- Global positioning system (GPS), available to loan from GMEU
- Compass

## Health and safety

We want you to remain safe. Before any survey is attempted, the route should be pre-walked and any potential risk assessed. Listed below are a wide variety of general hazards that you might encounter when working in the field along with precautions to reduce the risks: -

<i>Example risk</i>	<i>Example precautions</i>
<i>Undulating / rough terrain and steep slopes</i>	<i>Select appropriate footpath / route. Wear appropriate footwear with good soles and ankle support.</i>
<i>Weather</i>	<i>Ensure you are aware of the forecast prior to your work. This is of particular importance in the winter or when visiting remote areas.</i>
<i>Dense vegetation</i>	<i>Hazards such as holes, burrows, tree stumps or fencing may be obscured. Work with care in such conditions.</i>
<i>Protruding stems</i>	<i>Take care when bending to survey vegetation to avoid injuries to eyes.</i>
<i>Streams and rivers</i>	<i>Cross streams or rivers only by footbridges or other purposely built structures. Avoid any structures that appear damaged or poorly maintained.</i>
<i>Poorly maintained footpaths, stiles, etc.</i>	<i>Avoid these if possible and report to the appropriate agencies.</i>
<i>Lone working</i>	<i>Conduct survey work in pairs whenever possible</i>
<i>Secluded sites</i>	<i>If in doubt err on the side of caution and do not walk alone. Inform another person of where you are going, your route and estimated time of return and arrange for them to contact the authorities if you do not contact them to say you have arrived back safely.</i>
<i>'People' Hazards - might include poachers, strangers in isolated sites, irate owner/occupier, people with dangerous dogs, etc.</i>	<i>Exercise good judgement and assess the situation. Avoid confrontation and withdraw if threatened. Record any incident and inform the appropriate authorities. Carry a mobile phone. Operate lone working system and if in doubt do not work alone.</i>
<i>Farm animals</i>	<i>Heed any warning signage and avoid entering fields containing dangerous livestock.</i>
<i>People with firearms</i>	<i>If shooting is legal make yourself known audibly and visibly. If illegal, withdraw and report to the authorities.</i>
<i>Railways</i>	<i>NO fieldwork on active railways.</i>
<i>Hypothermia</i>	<i>Wear appropriate warm and waterproof clothing. Carry extra clothing and high energy food (e.g. chocolate).</i>

## Biosecurity

In the wake of the recent ash die back emergency, the Forestry Commission have updated their biosecurity guidance and produced a 13 page booklet on the subject. It is recommended that this is downloaded and read at

[http://www.forestry.gov.uk/pdf/FC\\_Biosecurity\\_Guidance.pdf/\\$file/FC\\_Biosecurity\\_Guidance.pdf](http://www.forestry.gov.uk/pdf/FC_Biosecurity_Guidance.pdf/$file/FC_Biosecurity_Guidance.pdf).

For low risk biosecurity control, ensure that footwear is clean prior to the visit (visually free from loose soil and plant debris). If necessary, brush or wash in soapy water before your visit. Keep vehicular access to a minimum, where practicable, keep to established hard tracks. Clean accumulated mud from vehicles. Observe signage at sites and follow any site specific biosecurity instructions.

Where a damaging tree pest is known or suspected to be present and there is a risk of spreading the pest further, a higher level of biosecurity control will be needed. Please refer to the above document. Higher level controls will be required if the site is under animal health control, for example foot and mouth disease.

# Farmland Breeding Birds Breeding Evidence Survey

## Background and survey aims

Nationally, the populations of farmland bird species have declined dramatically over recent decades and many farmland species have been assigned to the Red List published in *Birds of Conservation Concern 4: the population status of birds in the UK, Channel Islands and Isle of Man* <https://www.bto.org/science/monitoring/psob>

The data collected during this survey will allow us to monitor the abundance and distribution of farmland birds across the Carbon Landscape Programme area and create a baseline against which any future changes can be measured.

# Useful/essential equipment

- Binoculars
- Notebook
- GPS or phone with a grid reference location app (accuracy of 10m)
- Identification guides. Collins Bird Guide is recommended - also available as an app for Android and iPhone
- BTO identification videos are well worth watching  
e.g. <https://www.bto.org/about-birds/bird-id/bird-id-common-sparrows-reed-bunting>
- Calls/songs - the ability to identify birds by call and song is particularly valuable when carrying out surveys. Recordings can be downloaded from the Xeno Canto website in Mp3 format, <http://www.xeno-canto.org/collection/area/europe>, and an app is available for Android (search for Xeno Canto in the Play Store - the app is listed as Birds Sounds by Mathieu Groeneveld).
- Tally counter - may be useful for counting large flocks

# Survey timetable

You will be allocated a 1km survey square containing primarily farmland. Visit your square three times between 1<sup>st</sup> March and 30<sup>th</sup> June.

1. **Visit 1** - in **March/April** to record the habitats and crops, number the fields (if required) and map any areas (patches) within the fields where different crops or habitats are present.
2. **Visit 2** - early bird survey **early April to mid-May**
3. **Visit 3** - late bird survey **mid-May to end June**

Please leave a minimum of four weeks between the bird surveys.

# Planning your survey route

The same survey route will be used for all subsequent surveys (unless there is a compelling reason to change it). A map showing your allocated 1 Km square will be provided. Use this, in conjunction with a site visit to plan your route. As farmland birds are the target species, please select farmland habitat for the survey. The survey should be conducted from public rights of way wherever this is possible. Where access to private land is required, please refer to the Land Owner Permissions section above.

## Habitat survey

### *Field mapping*

You can print off a map of your 1-km square with the current field boundaries using this link [https://www.gmwildlife.org.uk/mapapp/?project=sub\\_sites&survey\\_date=dd-mm-yyyy&grid\\_square=sj7097](https://www.gmwildlife.org.uk/mapapp/?project=sub_sites&survey_date=dd-mm-yyyy&grid_square=sj7097). Just amend the grid square at the end of the hyperlink to match the 1-km square you are surveying.

If you, or another recorder, has already covered this square for the Winter Farmland Bird survey the fields will already have been numbered based on their agricultural usage over the winter. If the boundaries of the fields remain unchanged, then please use the field numbers shown on your map. If the boundaries have changed, or more than one crop has been planted in what was previously considered to be a single field, then retain the existing number and add a letter suffix to the new patches e.g. Field 1 may be split into 1A, 1B etc. If your map has no field numbers, then allocate each field a sequential number and mark these on the map provided.

- On your first visit check and amend any field boundaries as appropriate where these are different to the map. Include new boundaries and temporary fencing - divide and number such fields as separate patches even if the habitat is identical on either side since the two halves may change through the winter (e.g. different grazing). If there is more than one agricultural habitat within a field, divide it into patches and mark these on your map using the existing field number followed by a prefix letter e.g. 9a, 9b, 9c etc.
- If you have been allocated a 1 km square outside of the above-mentioned mosslands, apply your own sequential numbering system to the fields, starting with 1 and where necessary divide the land within individual fields into patches of agricultural habitats using a suffix letter e.g. 1A, 1B etc.
- When dividing your square into fields (or patches of similar habitat within a field) please only include land containing the following habitat types found on farms and small-holdings:
  - **Arable fields** - any stages of growth of crops, stubbles, bare tillage, flower/bulb fields, but not tree nurseries
  - **Set-aside/fallow** - typically grassy/weedy fields
  - **Permanent and temporary pasture** - include fields grazed by sheep, cattle and horses
  - **Farmyards** - including the yard buildings, farm house and garden (but no other gardens) as a separate patch
  - **Field boundaries** - include hedges, ditches etc
  - **Orchards**
  - **Livestock fields** including open-air pig and poultry farms
  - **Woodland**, including small farm woods - only survey the outer edge (2m wide) from the adjacent field (patch) and treat as a boundary, i.e. like a hedge (see **Boundary Habitat surveying** below).

When defining patches, *uncropped* strips (e.g. grass strips, wildflower strips) around fields that are narrower than 20m wide should be included as integral parts of the main field rather than patches in their own right. Narrow strips of game cover crops should be defined as separate patches.

## Habitat codes

On your first visit select the field habitat codes that best describe the majority of the habitat for each field, or patch within the field, and enter these in the field habitat columns of the habitat form. See the *Habitat Form* for details about how to use the codes and for brief explanations of some of the codes and the *Farmland Crops Sheet* for pointers to identifying crops. If you are still unsure do not guess - please ask the farmer, or assign a more general code.

## Boundary habitat surveying

For each field, or patch, please list, in decreasing order of importance, the boundary types present using the 8 types described on the habitat recording form:

<b>B</b> - Buildings	<b>TH</b> - Tall hedge (> 2m high) or wood edge
<b>D</b> - Ditch or other water course	<b>TL</b> - Tree line (e.g. shelter belt)
<b>F</b> - Fence line or wall	<b>V</b> - No structure, just vegetation between crops
<b>LH</b> - Low hedge (<2m high)	<b>X</b> - Other boundary type (describe separately)

For example, if a boundary consists mostly of tall hedges but with a short section of fence write “TH, F” in the Boundary habitat column. If there are equal amounts of two types record with an equals sign (e.g. TH = V for a field with half its boundary as tall hedge and half vegetation only).

**Important** – Please take your completed habitat survey form with you when carrying out the bird surveys. After recording the birds in each field, check for any changes to the agricultural habitats/crop stage and enter these onto a new habitat form, using a separate form for each visit. If the habitat changes within part of a patch on a later visit use the code for the majority of the field. If for some reason you cannot view certain farmland patches, enter NS (i.e. not surveyed) in place of a patch habitat code. This will tell us whether the lack of birds is because the fields were not surveyed rather than being poor for birds.

## Breeding farmland birds survey methodology

### *Target species*

The focus of this survey is 31 priority species of farmland birds, listed below, many of which are declining and appear on either the Red or Amber Lists of Birds of Conservation Concern (e.g. Tree Sparrow). However, we would also like you to record the supplementary species, also listed below, to gain a broader picture of the birds using the Carbon Landscape’s farmland.

Target Species					
BO	Barn Owl	HS	House Sparrow	SN	Snipe
BL	Brambling	L.	Lapwing	ST	Song Thrush
BF	Bullfinch	LI	Linnet	SG	Starling
CH	Chaffinch	LO	Little Owl	SC	Stonechat
CB	Corn Bunting	MP	Meadow Pipit	SD	Stock Dove
CU	Curlew	M.	Mistle Thrush	TS	Tree Sparrow
CK	Cuckoo	PW	Pied Wagtail	WT	Willow Tit
FF	Fieldfare	LR	Redpoll (Lesser)	Y.	Yellowhammer
GO	Goldfinch	RE	Redwing	WC	Whinchat
GR	Greenfinch	RB	Reed Bunting	YW	Yellow Wagtail
GP	Golden Plover	RO	Rook		
P.	Grey Partridge	S.	Skylark		

Supplementary Species						
B.	Blackbird		G.	Green Woodpecker	RT	Redstart
BC	Blackcap		HM	House Martin	RL	Red-legged Partridge
BH	Black-headed Gull		JS	Jack Snipe	RW	Reed Warbler
BT	Blue Tit		JD	Jackdaw	RP	Ringed Plover
BZ	Buzzard		J.	Jay	R.	Robin
CW	Cetti's Warbler		K.	Kestrel	RU	Ruff
CC	Chiffchaff		KF	Kingfisher	SW	Sedge Warbler
CT	Coal Tit		LB	Lesser Black-backed Gull	SE	Short-eared Owl
BZ	Buzzard		LW	Lesser Whitethroat	SH	Sparrowhawk
CG	Canada Goose		LO	Little Owl	SF	Spotted Flycatcher
C.	Carrion Crow		LP	Little Ringed Plover	TO	Tawny Owl
CD	Collared Dove		LE	Long-eared Owl	TP	Tree Pipit
CM	Common Gull		LS	Lesser Spotted Woodpecker	SM	Sand Martin
D.	Dunnock		LT	Long-tailed Tit	RE	Redwing
FP	Feral Pigeon		MG	Magpie	SL	Swallow
FF	Fieldfare		MA	Mallard	SI	Swift
GW	Garden Warbler		MU	Mediterranean Gull	T.	Teal
GH	Grasshopper Warbler		MR	Marsh Harrier	TC	Treecreeper
GB	Great Black-backed Gull		MS	Mute Swan	WA	Water Rail
GL	Grey Wagtail		ML	Merlin	WH	Whitethroat
G.	Green Woodpecker		MH	Moorhen	WW	Willow Warbler
H.	Grey Heron		NH	Nuthatch	WN	Wigeon
GJ	Greylag Goose		OC	Oystercatcher	W.	Wheatear
HH	Hen Harrier		PE	Peregrine	WK	Woodcock
HG	Herring Gull		PH	Pheasant	WP	Woodpigeon
HY	Hobby		PG	Pink-footed Goose	WR	Wren
GC	Goldcrest		RN	Raven	WG	White-fronted Goose
GS	Great Spotted Woodpecker		KT	Red Kite		
GT	Great Tit		RK	Redshank		

Additional species not on the above lists may also be recorded if you consider these noteworthy e.g. Common Crane, however, please bear in mind that Cheshire and Greater Manchester County Rarities will be subject to acceptance by the relevant county rarities committee. The Cheshire list may be found here, <http://www.cavos.org/rarities.htm>, and the Greater Manchester list here, <http://www.manchesterbirding.com/record-submission.html>

A GM rarity form can be downloaded from <http://www.manchesterbirding.com/record-submission.html>

In addition please record any sightings of **Brown Hare** as this is also a priority species which we are keen to monitor and update the data collected during the North West Brown Hare Project which finished in 2012.

## *Weather*

Avoid surveying on days of heavy rain, strong winds or poor visibility. Not only will it be difficult (and unpleasant) for you, the birds will be sheltering during bad weather and consequently be less detectable.

## *Times*

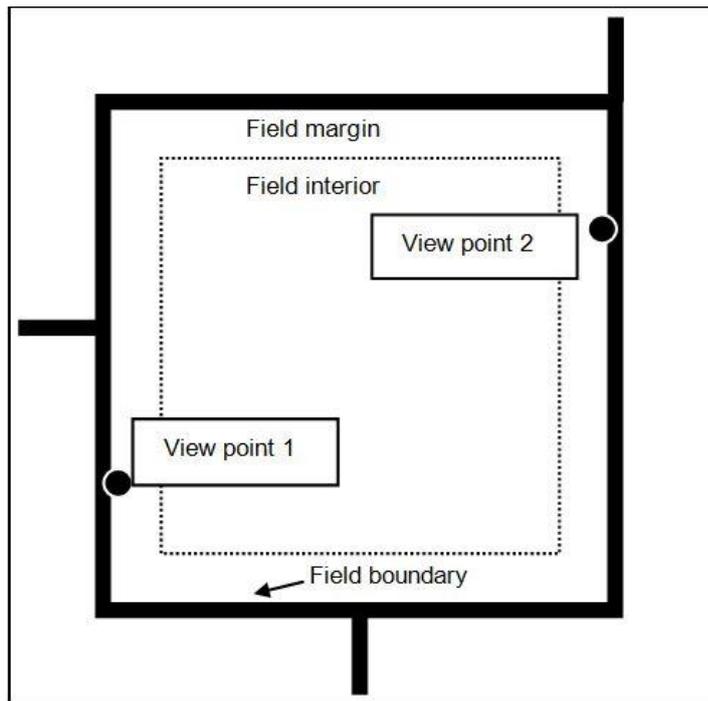
Please aim to start your survey between 6am and 7am whilst avoiding the first 30 minutes after sunrise when the dawn chorus may prove distracting. Ideally, you should finish no later than midday, as bird activity declines from mid-morning onwards.

## *Bird recording*

Before starting the survey, enter the date, start time and weather conditions onto the field recording form. Walk at a slow, methodical pace around the perimeter of as many fields as possible within 2 to 4 hours, pausing to identify and record birds, as required, whilst avoiding standing in the same spot for prolonged periods.

Allocate all birds seen, or heard, to one of the following zones (see diagram, below of a simplified field and these zones): -

- **Field boundary** - features such as hedges or stone walls, plus any 'verge' vegetation between that and the crop or uncropped margin
- **Field margin** - the outer 20m of the field which may include a buffer strip and part of the crop.
- **Field interior** - everything beyond 20m into the crop



Enter the numbers of each species in the appropriate column of the recording form.

When surveying fields, birds should be recorded in the zone in which they are first detected. If a bird is flushed from the margin into the hedge, it should be recorded in the margin. However, if a flock is continually moving between the margin and the hedge, record them in the margin category since this is likely to be where they are feeding. If a field is so narrow that the whole of it is taken up by the margin zone (i.e. less than 40m wide) record birds in either the boundary or the margin since there is no interior. If birds move between fields try to avoid counting them twice (sometimes a matter of judgement). Any birds which are not conclusively identified should not be recorded e.g. distant finches or birds flushed into deep cover.

## Birds in the boundaries

Allocate birds and flocks to the following boundary types:

Code	Description	Code	Description
B	Buildings	TH	Tall hedge (> 2m high) or wood edge
D	Ditch or other watercourse	TL	Tree line
F	Fence line or wall	V	No structure, just vegetation between crops
LH	Low hedge (< 2m high)	X	Other boundary type (describe separately)

Record these counts in the **Boundary type & count** column of the recording form using the breeding evidence codes, covered below, as suffixes after the number of birds in each boundary type (e.g. 10TH, 5LH means 10 birds in tall hedge and 5 in low hedge).

Please also take care to scan field vegetation carefully for skulking birds, flocks etc. Do this at least once on each side of the field (e.g. at similar positions to those indicated by the dots on the diagram - ideally diagonally opposite).

Ideally you should walk around each field separately. Inevitably this means walking down both sides of some boundaries. Only where the boundary is open (e.g. fence line, low wall or ditch) can you survey both sides of the boundary from one field. If you see birds in an adjacent field record these sightings in the usual way, taking care to avoid counting the same birds twice.

## Breeding evidence codes

This is an important element of the survey which will enable the number of territories per species to be estimated and their breeding status within each 1 km square to be established, as well as totals across the Carbon Landscape.

	Non-breeder		Probable breeder
7	Flying over	B	Nest <u>B</u> uilding or excavating nest-hole
	Possible breeder		Confirmed breeder
S	<u>S</u> inging male	DD	<u>D</u> istractio <u>n-D</u> isplay or injury feigning
	Probable breeder	UN	<u>U</u> sed <u>N</u> est or eggshells from this season
P	<u>P</u> air in suitable nesting habitat	FL	Recently <u>F</u> ledged young or downy young
T	Permanent <u>T</u> erritory (defended over 1+ week)	ON	Adults entering/leaving nest-site, or sitting, in circumstances indicating <u>O</u> ccupied <u>N</u> est
D	Courtship and <u>D</u> isplay (e.g. pair mating)	FF	Adult carrying <u>F</u> aecal sac or <u>F</u> ood for young
N	Visiting probable <u>N</u> est site	NE	<u>N</u> est containing <u>E</u> ggs
A	<u>A</u> gitated behaviour (indicating nest or young)	NY	<u>N</u> est with <u>Y</u> oung seen or heard

Use the code(s) which best describe what you have seen, or heard, and enter them against the bird count in the appropriate column. As the breeding codes may not relate to all the birds of a particular species seen in the boundary, margin or interior of a field, input these onto separate rows of the recording form where necessary.

For example if 6 Yellowhammers were observed in a field, one male singing from a boundary hedge, a pair in the margin and three other birds in the interior, these would be input as follows: One pair should always be recorded as 2P and 2 pairs as 4P.

Field or patch no.	Species code	Boundary type, count & code			Field margin count & code ( ≤ 20m )		Field interior count & code ( ≥ 20m )		Flying over count, <u>dir</u> & time		
		Boundary type	Count	Breeding code	Count	Breeding code	Count	Breeding code	Co	Dir.	Time
3	Y	TL	1	S	2	P	3				
3	Y	TH	1	B							

## Flocks

The number of birds in large flocks is generally estimated by initially counting blocks of 5 or 10 individuals and then by counting the numbers of such groups in the flock. Groups of 50 or 100 can be used if the flocks are very large and an allowance made for the varying densities of birds.

If large numbers of birds are moving, or are thought likely to leave (e.g. because of impending disturbance), the following should allow at least an approximate count. Make a quick total count (don't separate species); then make a quick assessment of proportions of species, starting with the most common species; then re-scan slowly for less common species; finally, scan slowly through the whole flock recording accurate counts of separate species. A tally counter and notebook may be useful in addition to the recording form.

## Birds in flight

Birds in flight over the survey area, e.g. Stock Doves flying over that are not making use of the habitat, should be recorded by putting an arrow through the species code e.g. CH ↗. This information is important in order to determine if the birds are using the farmland habitats or simply flying over. N.B. Birds flying between different areas of the 1km square and then seen to land should be recorded in the appropriate field. Birds that are about to land or have just been flushed should be included - as should raptors and owls hunting over fields. Any birds not conclusively identified (e.g. flushed partridges or distant finches) should be ignored.

**Orchards, farmyards and gardens** - record everything as being in the boundary or interior (no margin). **Woodland** - do not survey except where it abuts a field and then only record birds in the outer 2m of the wood, i.e. as if it was a hedge and allocate birds to the boundary of the patch you are in using the boundary code 'TH' for 'tall hedge or wood edge'.

**Do not count birds** within woodland, fish farms, watercress beds, plant/shrub nurseries, allotments, rare-breeds / childrens' farms, animal sanctuaries, plantations, common land, grazed heathland, grazed airfields or grazed cemeteries.

**End of survey** - remember to record the end time on the first page of the recording form.

If you run out of forms either print extra copies from

[https://www.gmwildlife.org.uk/carbon\\_landscape/](https://www.gmwildlife.org.uk/carbon_landscape/)

or contact The Greater Manchester Ecology Unit via email

[carbonlandscape@gmwildlife.org.uk](mailto:carbonlandscape@gmwildlife.org.uk)

or telephone 0161 342 4121

**Breeding seasons 2019 and 2020** - please ensure that you survey the same fields (patches) as before. Stick with the same numbering scheme too unless the field and crop boundaries have changed. If a field has been split up since last year, label the new fields using the original number plus a letter suffix e.g. patch 1 is split into patch 1A and patch 1B). If 2 or more patches have now been combined, label this year's patch with a completely new number to avoid confusion when analysing the data e.g. patches 1 and 2 become patch 15 (or whatever number is next in the sequence which hasn't previously been used).

## Additional Records

Any additional species, that are observed whilst carrying out the survey e.g. mammal sightings (especially Brown Hare) or mole hills will be very welcome and these can be submitted together with the survey results.

## Feedback

Once you have carried out the surveys, we would welcome your feedback on this survey manual and the accompanying recording forms. Please email [carbonlandscape@gmwildlife.org.uk](mailto:carbonlandscape@gmwildlife.org.uk) with your suggestions for clarifying/improving the survey instructions and whether it would be beneficial to include additional information.

# Appendices

## Grid references

GPS often display grid references of 10 figures which would imply an accuracy of 1m<sup>2</sup>. Most GPS will give a ± accuracy number. If this number is 10m or less, an 8 figure grid reference can be recorded to reduce this false accuracy (i.e. a grid reference which has an accuracy of 10m rather than 1m).

If you have a 10 figure grid reference (accurate to 1m) and you want to obscure it to an 8 figure grid reference (accurate to 10m), the following example shows you how to remove the final digits from the easting and northing to reduce the precision.

*GPS Reading SD 58315 03315 → Recorded Grid Reference SD 5831 0331*

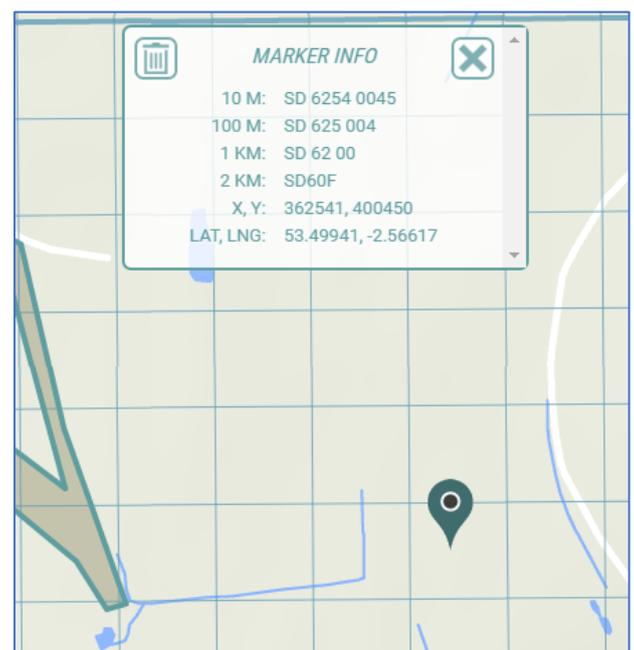
If you have an 8 figure grid reference (accurate to 10m) and you want to obscure it to a six figure grid reference (accurate to 100m), the following example shows you how to remove the final digit from the easting and northing.

*8 Figure Grid Reference SD 5837 0337 → 6 Figure Grid Reference SD 583 033*

**Be careful** – never round the numbers up when reducing the accuracy of a grid reference as it would move your record to an adjacent grid square north-east of the actual location.

The screenshot here shows different levels of precision for the same marker location on the map. Click this link and then click on the marker to try this yourself -

<https://gmwildlife.org.uk/mapapp/?path=SD6254500455>



# References

<i>Free downloads</i>		
1	<p>Gregory, R.D., Noble D.G. &amp; Custance J.</p> <p>The state of play of farmland birds: population trends and conservation status of lowland farmland birds in the United Kingdom.</p> <p>Ibis (2004) 146 (Suppl.2) 1-13</p>	<p><a href="https://onlinelibrary.wiley.com/doi/full/10.1111/j.1474-919X.2004.00358.x">https://onlinelibrary.wiley.com/doi/full/10.1111/j.1474-919X.2004.00358.x</a></p>
2	<p>Harris, S.J., Massimino, D., Gillings, S., Eaton, M.A., Noble, D.G., Balmer, D.E., Procter, D. &amp; PearceHiggins, J.W. 2017.</p> <p>The Breeding Bird Survey 2016.</p> <p>BTO Research Report 700 British Trust for Ornithology, Thetford.</p>	<p><a href="https://www.bto.org/sites/default/files/bbs-report-2016.pdf">https://www.bto.org/sites/default/files/bbs-report-2016.pdf</a></p>

3	<p>Eaton, M.A., Lock L., Brown, A. F., Noble, D. G., Musgrove, A. J., Hearn, R. D., Aebischer, N. J., Stroud D.A., &amp; Gregory, R. D. 2015.</p> <p>Birds of Conservation Concern 4: the population status of birds in the United Kingdom, Channel Islands and Isle of Man.</p> <p>Brit. Birds 108: 708-746.</p>	<p><a href="https://britishbirds.co.uk/wp-content/uploads/2014/07/BoCC4.pdf">https://britishbirds.co.uk/wp-content/uploads/2014/07/BoCC4.pdf</a></p>
4	<p>Hayhow DB, Ausden MA, Bradbury RB,</p> <p>Burnell D, Copeland AI, Crick HQP, Eaton MA, Frost T, Grice PV, Hall C, Harris SJ, Morecroft MD, Noble DG, Pearce-Higgins JW, Watts O, Williams JM.</p> <p>The State of the UK's Birds 2017</p> <p>RSPB, BTO, WWT, DAERA, JNCC, NE and NRW, Sandy, Bedfordshire</p>	<p><a href="https://www.bto.org/file/344157/download?token=OR0IQe8r">https://www.bto.org/file/344157/download?token=OR0IQe8r</a></p>

END OF INFORMATION