Plant Survey Volunteer Handbook

Greater Manchester Ecology Unit

April 2018

Funding raised by The National Lottery and awarded by the Heritage Lottery Fund

heritage lottery fund LOTTERY FUNDED

Plant 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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Document version: 26-04-2018

Cover photo Ragged-Robin (Silene flos-cuculi) courtesy of Debbie Wallace ©

Contents

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 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 plants and other target species, 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 lifetime of the 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, monitoring changes to the landscape over time and to influence future sustainable management.

Survey data 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 available 1km survey squares and view those already allocated, see 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 plant distribution at a landscape scale.

Submitting your survey data

When carrying out your survey, please enter your data onto the field survey forms provided. Your data should ideally be submitted to GMEU as soon as possible after each survey visit. We are currently developing an online data entry portal and will inform you once this is live. However, as an interim measure survey forms should be scanned and emailed to carbonlandscape@gmwildlife.org.uk or posted to Greater Manchester Ecology Unit, at the address shown on page 2. If sending by post, please ensure you retain a copy of your data as a backup.

Land owner permissions

Landowners' permission for access onto private land must be obtained where there are no public rights of way. 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/) 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: -

- Survey route map
- Field survey form
- Clipboard, recording form 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 (may be useful)
- 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: -

Example risk	*Example precautions*
Undulating / rough terrain and steep slopes	*Select appropriate footpath / route. Wear appropriate footwear with good soles and ankle support.*
Weather	*Ensure you are aware of the forecast prior to your work. This is of particular importance in the winter or when visiting remote areas.*
Dense vegetation	*Hazards such as holes, burrows, tree stumps or fencing may be obscured. Work with care in such conditions.*
Protruding stems	*Take care when bending to survey vegetation to avoid injuries to eyes.*
Streams and rivers	*Cross streams or rivers only by footbridges or other purposely built structures. Avoid any structures that appear damaged or poorly maintained.*
Poorly maintained footpaths, stiles, etc.	*Avoid these if possible and report to the appropriate agencies.*
Lone working	*Conduct survey work in pairs whenever possible*
Secluded sites	*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.*
'People' Hazards - might include poachers, strangers in isolated sites, irate owner/occupier, people with dangerous dogs, etc.	*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.*
Farm animals	*Heed any warning signage and avoid entering fields containing dangerous livestock.*
People with firearms	*If shooting is legal make yourself known audibly and visibly. If illegal, withdraw and report to the authorities.*
Railways	*NO fieldwork on active railways.*
Hypothermia	*Wear appropriate warm and waterproof clothing. Carry extra clothing and high energy food (e.g. chocolate).*

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.

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.

Plants Survey

Background

Two recording surveys are carried out, one in late spring or early summer, and the other in late summer. A reconnaissance visit is carried out prior to the first survey in order to set up a survey route and one or two survey plots. Some aspects of the survey methodology are based on the 2015 National Plant Monitoring Scheme (NPMS) methodology and others aspects are attributed to the Plantlife Wildflowers Count Survey. The survey aims to be accessible to volunteers of differing levels of experience and expertise, ranging from those who are able to produce a full list of all of the vascular plants they find and those who have a basic competence in vascular plant identification but are not able to identify all groups.

Equipment

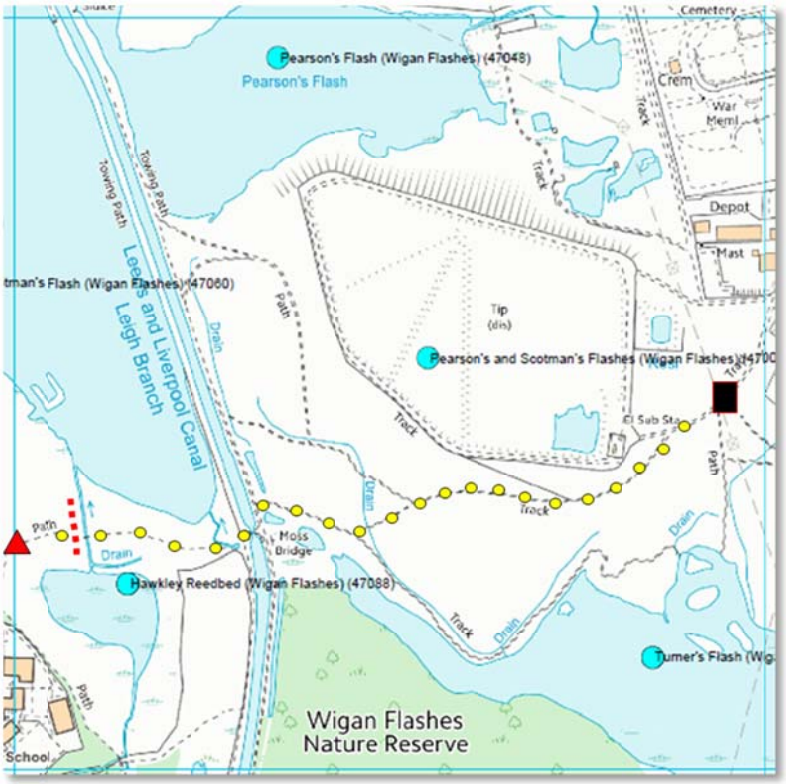
- GPS or phone with a grid reference location app (accuracy of 10m)
- Compass for locating plot directions.
- Plant identification guides
- Tape measure or thick string marked / knotted at 5m intervals (sufficient to mark out 25m or 40m depending on plot dimension)
- Four corner markers such as tent pegs or bamboo canes. N.B. markers should not be left in the ground
- Camera (particularly one which will take good close up photographs)
- Survey forms and Habitat Descriptions Sheet

Planning your survey and establishing new survey transects

Survey planning needs to be carried out before the first plant survey and only needs to be done once. The same survey route and survey plots will be used for all subsequent surveys (unless there is a compelling reason to change them). A map of your allocated 1Km square will be provided (Figure 1). Use this, in conjunction with aerial photographs (Figure 2) and a site reconnaissance visit to plant your survey route.

Take the two survey recording forms and complete section 1 on each form during the reconnaissance visit. The survey should be conducted from public rights of way whenever this is possible. Where access to private land is required refer to the guidance earlier in this guide.

Figure 1 – Example of a 1km square survey map



The ideal survey route will transect the 1km square (in any direction). The route should be approximately 1km but this does not need to be precise providing that the grid references are plotted along the route in order that it can be repeated.

Where access, land features or safety dictates the ideal survey route cannot be established, set up the route as close to the requirements as is practical.

Example start location Example end location Example 1km route Example of a linear feature

Figure 2 – Aerial photographs show different habitats

Useful online resources for planning routes include:

https://gmwildlife.org.uk/mapapp/?project=carbonlandscape

http://wtp2.appspot.com/wheresthepath.htm

http://www.bnhs.co.uk/focuson/grabagridref/html/

In addition to the 1km route, one or more survey plots should be established. Ideally, plots should be located within different habitat types to those which are present along the 1km route. This will provide an opportunity for a greater diversity of plant species to be recorded.

All the plants within the plot are recorded and a separate list made for each plot. The plots can be located more than 2m away from the 1 km route if this facilitates recording in a different habitat type. The plot location is recorded accurately in order to relocate the same survey plot during subsequent survey visits. A survey plot should meet the following criteria: -

- It should consist of only one broad habitat type (e.g. arable land, broadleaved woodland, neutral grassland or a hedgerow).
- If the plot is a linear feature (e.g. a watercourse, a field margin or a hedgerow), the plot dimensions should be 1m wide and 25m long but they do not need to be rectangular as your plot may follow a winding feature.
- If it is located within woodland, the survey plot size should be a square of 10 x 10m^2
- If the survey plot is located outside woodland, the survey plot size should be a square of 5 x 5m^2.

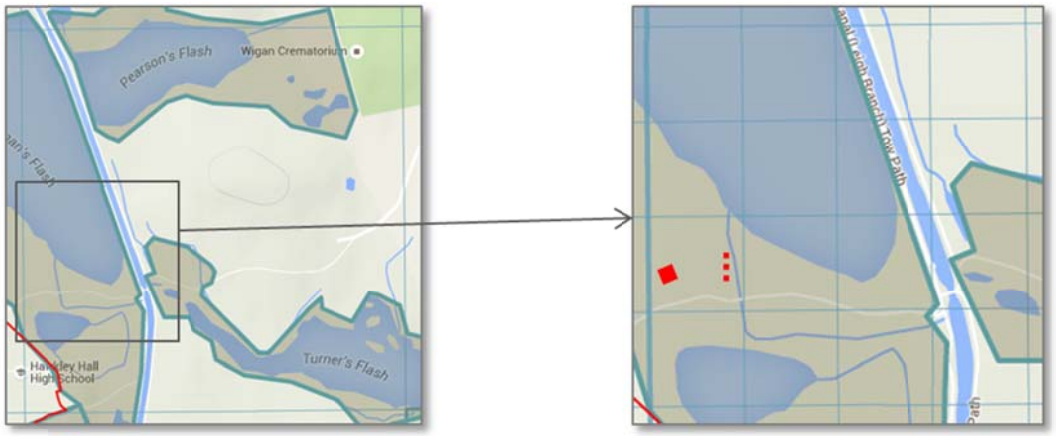


Figure 3 – 1km square with a zoomed in section showing 100m squares. A survey plot must fit within a single 100m square

Use corner markers (e.g.canes or tent pegs) and string / tape to mark out square plots. Use a clip board (or other suitable rightangle) in the corner. For the purpose of relocating square survey plots on subsequent visits, record an 8 figure grid reference (10m precision) at the south west corner of the plot. For relocating linear plots, record an 8 figure grid reference at the start and end of the linear plots. Photographs of the plot and sketch maps (Figure 4.) will aid accurate relocation. GPS devices are usually not accurate enough to relocate the plot from a grid reference alone.

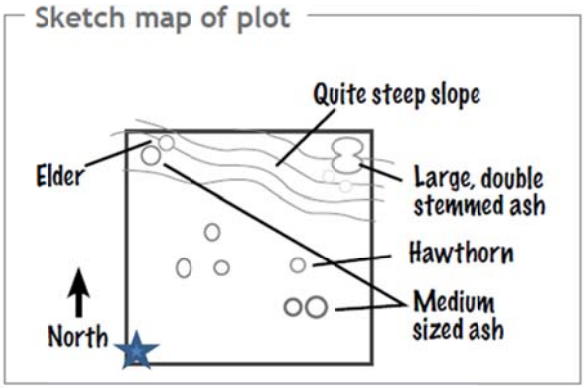


Figure 4 – Example sketch of a plot, the star denotes the south-west corner, ©NPMS 2015

When deciding how many survey plots to set up please consider the amount of time that you will be able to spend carrying out your survey. Please chose different habitat types for each of your plots. A maximum of 5 plots is recommended and these can be surveyed over more than one day if you wish to.

IMPORTANT: Remember to take sufficient survey recording forms and complete section 1 of each form during the reconnaissance visit.

Recording habitat types

This is recorded at the same time as the plant surveys on the survey forms. It is very likely that the broad habitat type will vary along the 1Km route and as individual plant species are recorded the habitat type should also be noted. Each individual plot will have one broad habitat type and this should be recorded for the plot and will be assigned to each of the species recorded in the plot. Habitat descriptions (and suggested abbreviations) are on the Habitat Descriptions Sheet.

Plants survey method

Recording along the 1Km survey route results in a 1Km square species list: -

- Using the Route Survey Form, locate the start of the 1 km route.
- Using form 1, record all of the vascular plants which you are able to identify within 2m either side of your 1km survey route (please do not record plants which lie beyond this as part of your survey).
- Record the species name and the broad habitat type where you first find it. If the plant is seen again in a different broad habitat, add that habitat type in the habitat column on recording form 1 (see example in Figure 5).
- Where plants in or adjacent to waterbodies are recorded, observe from a safe area of the bank.

Form 1 continued (1 km Route)	
Species name	Habitat(s) where the plant was recorded. See habitat descriptions sheet for details. Use codes (or your own shorthand) if preferred.
Cow Parsley	H, TR, NG
Hawthorn	H, HT, Sc
Hazel	H, HT
Cleavers	H, TR
Holly	H, HT, MW
Common Nettle	H, HT, MW, TR, NG, Sc
Hogweed	H, TR, NG, Sc
Yorkshire Fog	H, NG, Sc
Barren Strawberry	MW
Dog's Mercury	MW, H, HT
Remote Sedge	MW
Ramsons	MW
Wood Avens	H, HT, MW
Bramble	H, HT, Sc, MW
Foxglove	MW, HT
Red Fescue	NG
Red Clover	NG

Figure 5 – Example of part of a completed 1km route survey form

By carefully planning the location of your plots, you will be able to record in a range of habitat types. This should provide the opportunity to record many of the species which are present within the 1km square.

If you see a noteworthy plant* which is away from your survey route, this can be recorded as an additional record. It will be treated as a separate individual record as it will not form part of the repeatable survey. We do not want recorders to miss the opportunity to record what they consider to be an important record; therefore, please add this to the additional records section, adding habitat information, abundance and an 8 figure grid reference.

* A noteworthy plant may be an interesting or rare plant in the area or it may be an invasive plant species.

When recording plants within plots: -

- Re-locate and mark out the plot using corner markers and string / tape.
- Using form 2, record all of the plants inside the plot on the plot survey form (see example in Figure 6).
- Estimate and record the abundance of the species

Recording species abundance allows change to be evaluated over time as the surveys are repeated annually.

As you are searching your plot you will get a good idea of the abundance of each species and you **estimate** the amount of ground the species occupies (as a percentage of the total area of the plot). When doing this it is easy to just focus on the flowers. Don't forget the leaves!

Remember also that plants often grow in layers and can therefore cover other plants growing beneath them, so always look beneath larger plants. It helps to remember that 1% of a 5x5m plot or 25x1m plot is 50cm x 50cm and 1% of a 10x10m plot is 1x1m. You may want to create a square of this size to take out with you or simply measure and put in a marker. Where layers of vegetation exist, the sum of the % cover is likely to exceed 100%.

To be completed during survey		
Species name	Abundance	Stage (flowering / fruiting / in leaf)
Common Ivy	*40%*	*LF*
Holly	*20%*	*LF*
Red Campion	*5%*	*FL*
Broad Buckler Fern	*1*	*LF*

Figure 6 -. Example of part of a completed Plot Survey Form

It is important to record how complete your survey records are. The survey form has a section in which you record one of the following: -

1. A complete inventory list has been completed of all species seen. All vascular plant groups have been recorded. Flowering, fruiting and vegetative plants have been recorded. Only a small number of plants have not been identified.

2 A partial inventory list has been completed. Specify which plant groups have not been recorded e.g. no grasses, sedges and rushes or no ferns.

Where some species from groups of plants have been identified but some have not, you will be asked to record how many have been identified and how many have not, allowing an estimate to be made of the percentage of plants recorded in your plots.

SECTION 3 - To be completed at the end of each plot recording survey Please tick boxes or insert numbers					
Survey Date					
Vascular Plant Group(s)	Identified and recorded all	Number identified and recorded	Number found and not identified	Did not identify and record any	None found
Grasses, Sedges and Rushes				✓	
Ferns		2	1		
Trees / Shrubs	✓				
Herbaceous plants in flower	✓				
Herbaceous plants NOT in flower		8	4		

Figure 7 - Example of a Record of Completeness

How your records will be used

Some taxonomic groups, such as birds, have been the subject of structured surveys for many years and Carbon Landscape Project survey volunteers continue to add valuable records to this data. However, good quality survey data is less widely available for plants within the project area and this survey aims to fill this data gap.

The Carbon Landscape Project aims to protect and enhance existing habitat and to restore areas of degraded habitat which will increase species biodiversity. In order to protect existing plant species and improve habitat suitability for declining species, it is very important to understand which species are present and which habitats they occur in. It is equally important to know which species are currently absent from habitat which is suitable for them. The records from this survey will highlight potential opportunities for improvements and could also provide an early warning of developing problems.

When you submit your survey results through the Citizen Science Project, you will contribute a plant species list for your 1km square. This will be produced by combining the species recorded in your plots and the species recorded on your 1km survey route. If you submit any additional plant records (e.g. notable species), these will also be added to your list.

By recording grid references at key points along the 1km route and recording the accurate locations of your plots, you will create repeatable routes and plots which can be recorded in subsequent years. These repeatable surveys will enable change to be monitored.

Additional Records

Any additional biological records that are observed whilst carrying out the survey will be very welcome, (e.g. bird or mammal sightings and field signs such as mole hills). These records 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 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^2. 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).

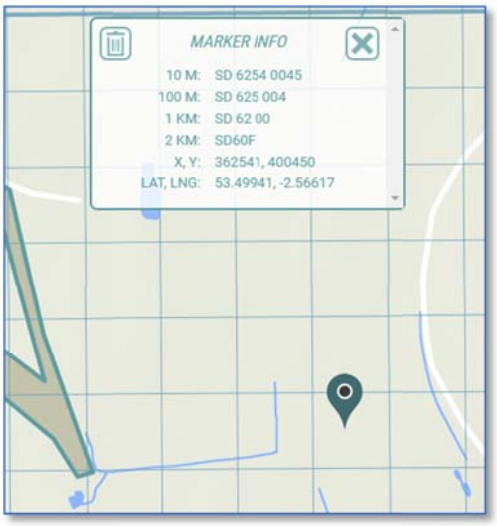
If you have a 10 figure grid reference (accurate to 1m) and you want to obscure it to an 8 figure grid reference (accurate to 10m), the following example shows you how to remove the final digits from the easting and northing to reduce the precision.

GPS Reading SD 5831~~5~~ 0331~~5~~ → 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 583~~1~~ 033~~1~~ → 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

END OF INFORMATION