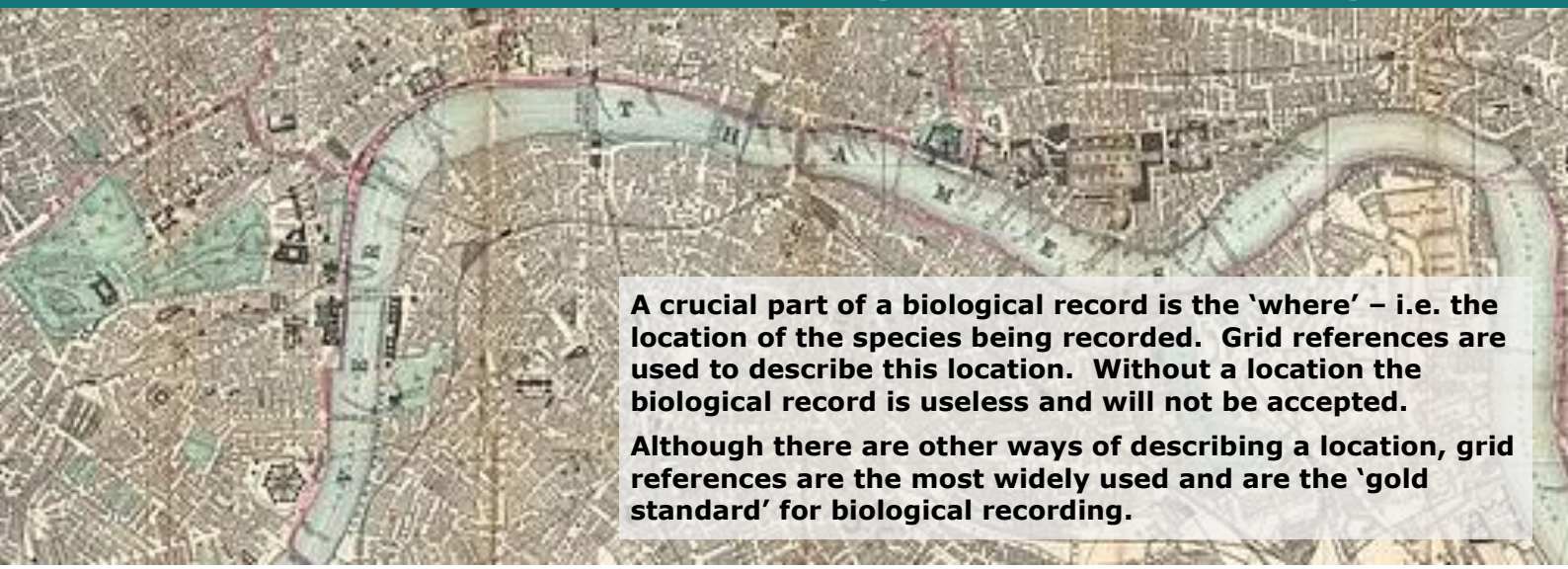
# Field Studies Guidance Note

## Grid References for Biological Recording



**A crucial part of a biological record is the 'where' – i.e. the location of the species being recorded. Grid references are used to describe this location. Without a location the biological record is useless and will not be accepted.**

**Although there are other ways of describing a location, grid references are the most widely used and are the 'gold standard' for biological recording.**

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | HO | HP | | |
| | | | HT | HU | | |
| | HW | HX | HY | HZ | | |
| NA | NB | NC | ND | NE | | |
| NF | NG | NH | NJ | NK | | |
| NL | NM | NN | NO | NP | | |
| | NR | NS | NT | NU | | |
| | NW | NX | NY | NZ | OV | |
| | | SC | SD | SE | TA | |
| | | SH | SJ | SK | TF | TG |
| | SM | SN | SO | SP | TL | TM |
| | SR | SS | ST | SU | TQ | TR |
| SV | SW | SX | SY | SZ | TV | |

## What are grid references?

**A grid reference specifies a square of land. The size of this square depends on the length of the grid ref.**

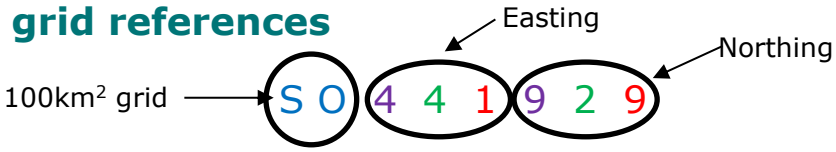
You may be familiar with what grid references look like. They start with two letters, which are then followed by an even number of figures.

For example **SO441929**.

What do the two letters at the start of a grid reference mean? Great Britain is covered by grid squares measuring 100 kilometres across and each of these grid squares is identified by two letters (see map to left). So, a grid reference beginning with the letters SO places it in 100x100km square SO, covering parts of Shropshire, Worcestershire, Herefordshire and mid-Wales.

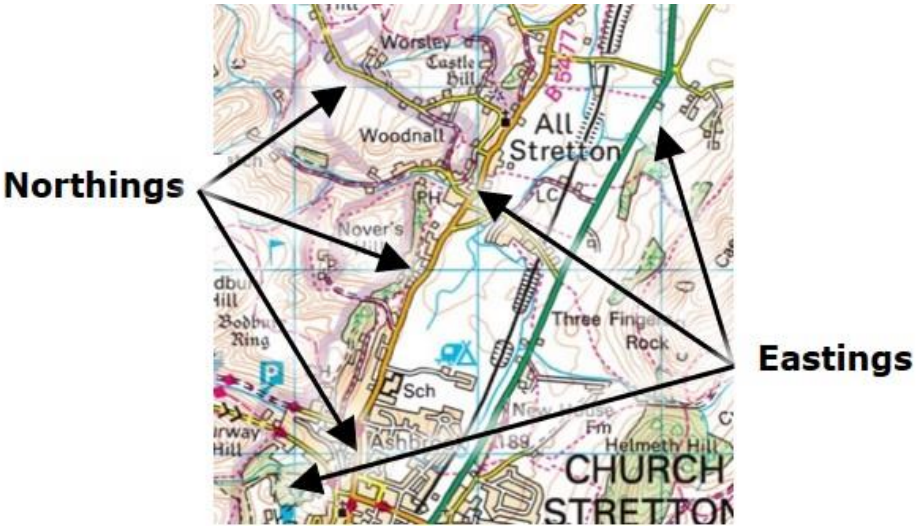
The numbers refer to smaller areas within these larger squares. The 100x100km squares shown on the picture are further divided into smaller squares by grid lines every 10 km. These 10km squares are then divided into 1km squares, which are divided into 100m squares, which are in turn divided into a 10m grid and so on.

## Reading grid references




**Blue letters** identify the 100km square somewhere in Great Britain e.g. **SO**
**Purple numbers** identify the 10km2 square within the 100km square e.g. **SO49**
**Green numbers** identify the 1km square within the 10km square e.g. **SO4492**
**Red numbers** identify the 100m square within the 1km square e.g. **SO441929**

Each grid line on an OS Map is numbered. Those lines running vertically from bottom to top represent **Eastings** and the number of the line increases as you travel from left to right (or west to east) across the map. Those lines running horizontally from left to right across the map represent **Northings** and the number of the line increases the further up the map (i.e. north) you go.

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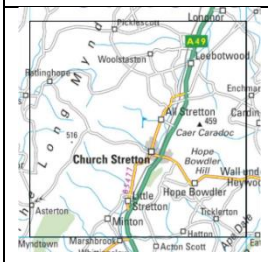
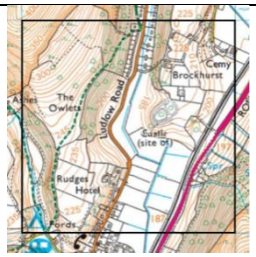
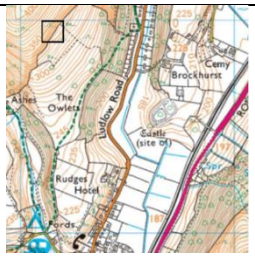
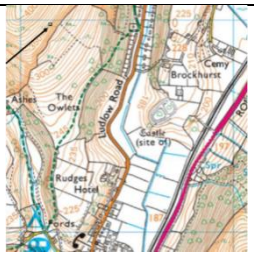
The first half of the numbers in a grid reference, i.e. SO**441**929, represent the Eastings. The second half, i.e. SO441**929**, represent the Northings. Grid references are always written with the Eastings first, then the Northings. Many people use 'along the corridor then up the stairs' to help them remember this.

## What size of area do they refer to?

| Two-figure | Four-figure | Six-figure | Eight-figure | Ten-figure |
|---|---|---|---|---|
| 10km by 10km | 1km x 1km | 100m by 100m | 10m x 10m | 1m x 1m |
| SO49 | SO4492 | SO441929 | SO44139298 | SO4413892981 |
|  |  |  |  | Too small to show! |



*Map images © Crown copyright and database rights 2019 Ordnance Survey (100049162).*

## How long should my grid reference be?

This depends. There is no right answer, but a good guideline is 'whatever is appropriate for the species bring recorded and the survey method used'. For example, if you are recording a roaming herd of red deer, or surveying a large field, a four-figure grid reference might be the most appropriate scale. It's rare to use a ten-figure grid reference, but if you're recording something small and sedentary, for example a rare orchid, you might decide it is appropriate.

A six-figure grid reference (100m$^2$) is appropriate for most species and is the most commonly used length of grid reference.

## Shortening Grid References

Often you will find that a grid reference is longer than you want, especially if you are using a location finding app or website (see below) which often produce ten-figure grid references. You will need to convert it to a more appropriate scale e.g. six-figure.

There are two common mistakes when shortening grid references:

- The first is to remove numbers from the end of the grid reference. This is wrong. Numbers need to be removed from the end of both the Northings and Eastings numbers. E.g. if you wish to shorten SO44139298 to six figures, removing the '98' from the end is incorrect. You need to remove the '3' from the end of the Easting, and the '8' from the end of the Northing.
- The other mistake people make when shortening grid references is to round the remaining numbers up or down. **This is wrong** and could move the grid reference into the incorrect location. Just remove digits from the end of the Easting and Northing without doing any rounding.

For example, the correct way to shorten SO44139298 to six figures is SO441929, not SO441930 (where the Northing has been rounded up).

SO44139298

**Latitude and Longitude**

Sometimes you will see locations given as Latitude and Longitude ('Lat-Long').

So, imagine the Earth was covered in imaginary circles, dividing the planet into sections running around the planet parallel to the Equator. These lines are called **latitudes** and specify the north-south position of a location in degrees, relative to the Equator (0° latitude), and the North and South Poles (90° North and 90° South latitudes respectively).

**Longitudes** are similar imaginary circles, but running between the North and South poles, intersecting the Equator. Half of a longitudinal circle is called a Meridian. They specify the east-west position of a location in degrees, relative to the Prime Meridian at Greenwich (0° longitude). Locations can be described by where a latitude and longitude meet, in a similar way to a grid reference. This is a Lat-Long location.

It is easy enough to convert from Lat-Long to Grid refs using an online converter or app, e.g. http://www.bgs.ac.uk/data/webservices/convertForm.cfm

However, **beware**: lat/long locations are point locations that specify any point on the Earth's surface, and grid reference refer to the whole square. Wherever possible it's best to get your locations as grid references to begin with.

## Finding a grid refenrence

### Websites

Several websites allow you to click on a map location and find the grid reference. Here are a few useful websites:

- **Cuacera** (which helpfully also shows your what vice-county the location is in) http://www.cucaera.co.uk/grp/;
- **Grid Reference Finder** (which also allows you to search and convert postcodes https://gridreferencefinder.com;
- **Bedfordshire Natural History Society grid reference tool** (very useful as it shows an aerial photo side by side with an OS map). https://www.bnhs.co.uk/2019/technology/grabagridref/gagr.php

### Devices and gadgets

- Mobile phone apps
- Tablets
- Watches
- Handheld GPS units

There are huge numbers of mobile and tablet location apps out there which will give you your location in a variety of formats, including grid reference. Search for 'grid reference' and you'll see! Examples include 'OS Locate' (screenshot right) and 'GPS OS' – but bear in mind that accuracy can be variable and it may take several minutes to update.


Many specialist watches will give an accurate grid reference, as will a handheld GPS device. However, make sure it is set to the correct 'datum' (grid reference system). If the device is set to the wrong datum your grid references will be incorrect – sometimes by hundreds of miles.

In Great Britain use the British National Grid (BNG) or **OSGB36 datum**. In Northern Ireland make sure you use the Irish Grid Reference system (**1965 Datum)**. If you don't, your device will try and apply the British Grid to Ireland and your grid reference will be incorrect.

### Maps

If all else (and your device battery) fails, you can work out your grid reference using the traditional method - from a paper OS map. The grid line numbers should be printed on the edges of the map and also every now and then on the map itself (blue numbers on blue lines). These numbers will give you a four-figure (i.e. $km^2$) grid reference – to get a six-figure grid reference you'll have to mentally divide the edge of each km square into 10. Remember to read the Easting first, then the Northings. Six figures is as accurate as you can get using this method – but that should be fine for most biological recording.

## References

GetOutside. (no date) *A Beginners guide to grid references* [Online] [30/01/2020] https://getoutside.ordnancesurvey.co.uk/guides/beginners-guide-to-grid-references/

Encyclopaedia Britannica (2020) *Latitude and longitude* [Online] [30/01/2020] https://www.britannica.com/science/latitude

Ordnance Survey (2015) *Map reading skills: How to read a grid reference* [Online] [30/01/2020] https://www.ordnancesurvey.co.uk/blog/2015/11/map-reading-skills-how-to-read-a-grid-reference/)

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**Reference:** **Bell, C. (2020) *Field Studies Guidance Note: Grid References for Biological Recording.* Field Studies Council. [Online] www.fscbiodiversity.uk**