

Grassland Quality Survey - More detailed instructions for setting up the survey

Survey preparation: How to plan your survey

Survey Preparation Step 1: Map where the grassland habitats are on the site

On many sites the grassland habitat does not cover the whole site. The first step is to map the extent of the grassland that you wish to monitor. The only way to do this accurately is by drawing the boundaries of your grassland on to an aerial image of the site. If you know the site well and the aerial image is of reasonably good quality, you may be able to do this as a desktop exercise at home.

If you find that you cannot decide where exactly to draw the boundaries on the image, then you will have to take the image out to the site with you, check where the grassland extends to and draw the boundaries onto the image as you do this.

On some sites the grassland habitat may be in more than one patch and these patches may not be joined together. That is no problem. It is ok to include more than one patch in the area that you are monitoring.

Exclude any areas from the monitoring that are not grassland. For example there may be patches of scrub, ponds or roads in the middle of the grassland areas. Draw boundaries around all of these non-grassland areas so that you can easily exclude them from the survey.

Mapping the extent of the grassland habitat is the most important stage in the whole monitoring process!

Survey Preparation Step 2: Decide if you will subdivide the site.

The next question to ask is does my site need to be subdivided into different survey areas? It is better to not do this if you can avoid it, because having a site with two survey areas is twice as much work as having a site with just one.

If you do subdivide the site, each survey area needs to be treated as a completely separate survey from then on. It would not be valid to start with two separate survey areas but then lump them together half way through, if you decided that it was too much work to continue to monitor both areas separately.

There are only two good reasons to subdivide a site: 1) because you want to be able to report separately on how different areas are doing, or; 2) because your site clearly has two (or more) different types of grassland.

You may want to report on different parts of the grassland separately if they are different fields, or if they will be managed differently. But you should only do this if you absolutely need to.

If your site clearly has two (or more) different types of grassland, it is usually better to subdivide the site, even if do not need to report on these areas separately. An example of this situation would be a grassland that had some areas dominated by grasses and/or weeds and others that were much more flowery. However, you should only subdivide the site if the two types of grassland are clearly different and it is easy to map the boundaries between the two types.

The advantage of subdividing sites like this is that each of the individual areas by itself will not include too much variation. This means you can have more confidence in your survey results giving a reasonably accurate estimate of the overall conditions.

On the other hand, if you lump two very different areas together you will be including a lot of variation in one survey area. It would then be difficult to prove if things are getting better or worse with any confidence.

If you have decided to subdivide your site, go ahead and mark the boundaries of the different survey areas on your aerial image. Then label the different areas clearly, so that you will know which is which later on.

Again, it is ok to have more than one patch in any one survey area. For instance, if your site had one patch of grassland that was weedy and three separate patches that were flowery and similar to each other, you might subdivide the site into two survey areas. Survey Area A would consist of the one weedy patch of grassland and Survey Area B would include the three flower-rich patches.

Survey Preparation Step 3: Work out if your survey areas are ‘big’ or ‘small’.

Some of the survey instructions below differ depending on whether your survey area is **big** or **small**, so this is the next thing you need to work out. The easiest way to do this is to measure each grassland survey area on your site.

Less than 3,000 square meters (about half the size of a football pitch) of grassland counts as **small** and more than this counts as **big**. 3,000 square meters equates to 0.3 of a hectare or 0.75 (three-quarters) of an acre. Areas that measure 60m x 50m, 30m x 100m or 10m x 300m all come to 3,000 square meters.

If you have subdivided your site into more than one survey area, you will need to work out separately whether each of these survey areas is **big** or **small**. You could end up with a site that has one **big** survey area and one **small** survey area and this is ok.

Remember that a survey area, can include more than one patch of grassland. To decide if this survey area is **big** or **small**, you only need the total area of all of the patches added together. The sizes of the individual patches does not matter.

Survey Preparation Step 4: Decide how many quadrats are needed.

Small survey areas: Fit in as many quadrats as you can, so that there are no parts of the grassland that are not included in a quadrat. In small survey areas this will come to no more than 30 quadrats, but it could be a lot fewer than this if your survey area is very small.

Each quadrat measures 100 square meters, so divide the total area of your survey area (in square meters) by 100 to find out roughly how many quadrats you will need. You will often find that you can't fit in exactly this number of quadrats, because of small areas on the edges that are difficult to include in a quadrat. So the actual number of quadrats you use, will often be a bit less than the total area divided by 100.

Big survey areas: If the grassland in your survey area is more or less similar throughout, we recommend that you do at least 30 quadrats. These 30 quadrats will not cover the entire survey area, so you will be doing a sample survey.

If your survey area includes more than one type of grassland and it was not practical to subdivide the site by mapping the different areas separately, because they were mixed together in a complicated way, then we recommend that you do at least 50 quadrats.

If you do fewer than 30 quadrats (or fewer than 50 in a variable survey area) your survey will probably not be very useful. You may not be able to prove if things are getting better or worse, or you may get a misleading result, because your sample size is too small.

Survey Preparation Step 5: Plan where to place the quadrats.

It is best to plan this out by marking the rough quadrat locations on a copy of the aerial image of your survey area, before you start the survey in the field. The quadrats will usually measure 10m x 10m, divided into four quarters of 5m x 5m. You may not get this plan right the first time you try it, so it is a good idea to make several copies of the aerial image, so that you can have more than one attempt at it.

Small survey areas: Fit in as many quadrats as you can so that most, or all, of the survey area is included in a quadrat. As grassland habitats often have irregular-shaped boundaries, you will probably end up with edges of your survey area not being included within any quadrats. This is ok, as long as the areas not included do not make up a very large proportion of the site when you add them all together.

If you have a lot of areas on the edges (or in narrow parts of the survey area) that are not included in one of your 10m x 10m quadrats, you can use 5m x 20m quadrats to fill any larger gaps. A 5m x 20m quadrat consists of four 5m x 5m quarters in a row. The important thing is that each of your quarter quadrats should be roughly 25 square meters in area. 5m x 5m squares are the easiest way to mark out an area of 25 square meters, but narrower rectangles (or other shapes) can also give you 25 square meters if you make them long enough. However, if it becomes too complicated or confusing to work it out, just leave these awkward areas out

Big survey areas: Position your quadrats at regular intervals throughout the whole survey area, so that they are more or less evenly spaced apart. Don't worry about being too precise about this, as long as they are more or less evenly spaced apart.

For both small and big survey areas, when you repeat the survey in future years, you do not have to find the original quadrat locations again, so there is no need to mark the location of your quadrats with a permanent marker in the field. Instead, when you repeat the survey you will plan where to position your quadrats again, by following a similar process to what you did the first time, without trying to go back to exactly the same locations.

Fieldwork

How to set up a quadrat in the field.

The most important thing here is that you are not biased in where you place the quadrats when you come to do the survey in the field. It is often tempting to place the quadrats around the 'best' areas, or around interesting plants. Or it may be tempting to avoid placing quadrats in weedy or grassy areas. Deciding where to place the quadrats based on what the grassland looks like in this way will lead to misleading results and so you should not do it.

Fieldwork Step 1: Work out where the centre of your next quadrat is.

Use the aerial image with the rough quadrat locations marked on from **Survey Preparation Step 5** to find where to place the quadrats in the field. Start at one end of the site and work out how far you need to walk and in what direction to get to the centre of the first quadrat. Multiply the number of meters you need to walk by 1.3 to get a rough idea of the number of normal walking strides you need to take. When you have finished surveying a quadrat, follow a similar process to work out how to get to the next one.

Fieldwork Step 2: Walk to and mark the quadrat centre.

Walk in the direction and for the required number of strides that you worked out in **Step 1**, without looking closely at the species in the grassland. When you have taken the last stride, immediately stick a bamboo cane in the ground next to the front of your boot, again without looking at the plants. This cane marks the centre of your 10m x 10m quadrat.

Fieldwork Step 3: Mark the four quarters.

Walk away from the centre cane in any direction, for seven normal walking strides (roughly 5 meters) and put another cane in the ground by your boot. Repeat this in the opposite direction from the first one. Then mark out two more canes on a line perpendicular to the first one, so that you end up with a cross. Finally, stick four more canes in at the corners, lining these corners up with the canes you have already stuck in the ground. Don't worry too much about the exact size and shape of the quadrat. As long as it is roughly right it will be ok.

Question? - What do I do if a 10m x 10m quadrat won't fit?

If you are in a part of the site that does not allow you to fit in a 10m x 10m quadrat, then mark out four 5m x 5m squares in a row instead. If even 5m x 5m squares don't fit, you can use different (longer and narrower) shapes, but if this becomes too complicated or confusing, just leave these awkward areas out.

Question? - What do I do if my quadrat lands somewhere that is not grassland?

If it happens early on in the survey, the best thing to do is to stop surveying and start the whole process again from **Survey Preparation Step 1**. This time, mark all of the non-grassland areas more accurately on your aerial image.

If it happens later in the survey (e.g. after you have already surveyed quite a few quadrats) it may be better to just omit that quadrat from the survey completely and carry on to the next one.

The ideal solution is to avoid this happening at all by spending time mapping the extent of your grassland areas accurately right at the start of the survey preparation, before you do anything else. See **Survey Preparation Step 1**.