1. Introduction
Curlew are generally shy and elusive birds and can be highly susceptible to disturbance during the breeding season, including well-intentioned observation by those not experienced in Curlew behaviour. Although birds can become habituated to regular and predictable disturbance events, and adapt their behaviour accordingly, the impact of disturbance is more pronounced when the events are unpredictable and irregular. For example, a bird coming into irregular contact with dog walkers who allow their dog to run off the lead is highly likely to react negatively to this behaviour (skulking away from the nest or taking to the air in agitation), whereas a bird that encounters regular, low level disturbance (e.g. in the form of regular dog walkers on marked paths who keep their dogs under control) is likely to habituate to this behaviour and largely ignore it after a period of time.

In areas where there is a high level of disturbance or where the disturbance events are unpredictable and acute (e.g. dogs running off the lead), there are some basic measures that can be implemented to reduce the amount of disturbance and generate public awareness of the presence of ground nesting birds. As well as increasing the chances of a successful breeding season for Curlew, there will likely be knock-on benefits for other ground nesting birds, including Lapwing *Vanellus vanellus*, Redshank *Tringa totanus* and Skylark *Alauda arvensis* to name a few. Outlined below are some simple methods that can be used to reduce disturbance and to promote community responsibility for breeding Curlew and associated habitat, along with other local wildlife vulnerable to disturbance.

2. Understand the problem
Before undertaking any mitigating action, it is important to understand what the problem is. Determine who the main groups responsible for disturbance are (e.g. dog walkers, ramblers), what times of the day/week/year they pose a problem and in what numbers. Determining this will enable you to focus mitigation measures at the right groups at the right time, as it might be that different groups are problems at different times.

3. Mitigation measures

3.1. Signs
The use of signs that inform the public of the presence of ground nesting birds is a simple and relatively cost-effective way of increasing awareness amongst the local community and can potentially help to change the behaviour of visitors to the site who may have been previously unaware of the situation and their impact. Figure 1 shows an example of an information sign that has been used successfully at sites where there have been disturbance issues.

When designing a sign it is important to know who you are engaging with and to target the messaging towards them. If it is general disturbance you are trying to limit, then highlighting the species at risk of disturbance can be a good approach – however, if there is a specific target group involved then signs containing relevant images are much more likely to attract the target groups attention than signs that don’t. For example, if your main target group is dog walkers then signs containing photos of dogs enjoying themselves are more likely to be read than signs that simply contain photos of birds or other wildlife.

It is important to avoid encouraging disturbance. For example, a Curlew that can be seen through binoculars and where the observer is not concealed in the habitat or a hide will disturb Curlews starting or engaged in breeding activity. Signs telling people that there are Curlews or other species present should be applicable to as large an area as possible, avoiding all references to nest locations. Signs would ideally be placed at farm scale, e.g. “Curlews nest in this area. Please.....”

Be sure to adopt a friendly and engaging tone within any text that accompanies the images. People respond to polite requests much more readily than demands and are much more likely to comply if the tone is respectful and engaging.
Only keep the signs up as long as they are necessary. By keeping signs up all year round you run the risk of them losing their impact, especially if the message relates only to the breeding season. It increases the workload but prevents the signs being ignored after a season.

Figure 1. Photograph showing a sign highlighting the presence of ground nesting birds on a site in Gloucestershire. Sign created by Gloucestershire Naturalists Society

3.2. Social media
By using social media platforms (e.g. Facebook, Twitter and Instagram) you can increase the number of people you engage with without a great deal of extra effort, but this does require an individual or individuals who are prepared to take responsibility for maintaining this presence. There is likely to be a community Facebook page that you can engage with directly or you could set up a ‘friends of’ page that allows people to join and share information. Twitter and Instagram are good platforms for engaging immediately and directly with a wider audience, sharing photos and posts throughout the season. These platforms are also good ways of establishing dialogue with certain interest groups that may be causing inadvertent disturbance (e.g. remote-controlled aircraft groups), that may be difficult to engage with through more traditional methods. However, it is important to avoid disclosing geographical information that could lead to disturbance, such as specific locations of small Curlew colonies.

3.3. Talks/presentations
Engaging with the local community is a key way of getting people on board with your message and it is also a good way to recruit potential volunteers. If there are key groups you are wanting to engage with then contact local groups and/or clubs and see if they are interested in being given a talk about the project, the issues with disturbance and how they can be part of the solution.

3.4. Leaflets
If you have the permission of the land managers, it can be useful to have leaflets at access points that people can read and take home with them. As with signs, understand you target audience, keep the text clear and concise and adopt an engaging tone. Providing links to additional information is a useful addition.

3.5. Wardens
If there are willing volunteers then having wardens on site at key times to engage with the public can act as an additional measure alongside signs and/or leaflets. This can be a great source of providing additional information for visitors and helping to get them engaged and onside. The volunteers must be comfortable engaging with strangers and be able to get the points across in a polite and engaging manner. If dog walkers are the main cause of disturbance it can be useful to have dog owning volunteers on-site who are able to set an example of good practice. It works to break down the ‘us vs you’ barrier that can sometimes arise when dog walkers are confronted about their behaviour. Training of volunteers may be required.

4. Further reading
Further recommendations about strategies for public engagement to mitigate impacts can be found in this recent paper in Wader Study: https://www.waderstudygroup.org/article/14636/