Background
Since August 2014 BSG Ecology has been using thermal imaging cameras to determine the nocturnal distribution of golden plover Pluvialis apricaria on a proposed wind farm site.

Carrying out nocturnal surveys for birds has always been challenging. With less specialised (typical) night vision equipment (an established method for nocturnal survey), it is only possible to cover relatively small areas in comparison with equivalent daytime surveys, and estimating the numbers of birds present in fields, their distribution and activity can prove difficult.

The Technology
Thermal imaging cameras are designed to detect heat (infrared radiation) emitted from objects within a defined field of view. The metabolic heat produced by birds (in this case) produces a distinct thermal image against a cooler background.

Since artificial illumination is not required, the risk of disturbing birds (or other wildlife) being surveyed can be greatly reduced through survey design. Open fields can be scanned for birds from vantage points much more readily and effectively than through deploying night vision equipment that uses infra-red illumination; the camera provides clear images and both stills and video footage can be recorded.

BSG staff are trained to operate and carry out field surveys using the FLIR 650sc camera and in the post-processing of thermal data.

The Project
Wintering golden plover flocks are known to occur within the area around the proposed wind farm, and potentially form part of a population associated with a Special Protection Area (SPA) a few kilometres from the site.

To inform the Ecological Impact Assessment (EcIA) and, as necessary, a Habitats Regulations Assessment (HRA) for the development, it will be important to understand the pattern of use of the site, both nocturnally and diurnally, and its apparent function to golden plover.

Surveying plovers during daylight hours is readily completed using a combination of standard vantage point survey methods and instantaneous counts of birds in fields. During daylight hours plovers will often form flocks in open areas (large fields) with a good field of view, while after dark small parties and single birds will disperse to preferred foraging areas.

The thermal imaging survey has allowed us to identify and count flocks of golden plover at distances of up to 200m. Birds are identified on the basis of size, structure and the way they move; the survey team includes an experienced ornithological surveyor and trained camera operative. Photographs and video recordings are taken. Flocks of birds can be detected at up to 500m in open arable landscapes, although a closer approach is usually necessary to confirm species and obtain accurate counts.

The results to date have shown that the level of nocturnal golden plover activity recorded within the site is restricted to occasional small flocks and individual birds – numbers which are likely to be low in the context of the local area.

During the course of the work a range of other nocturnal fauna has been recorded including a hunting barn owl, foraging badgers, rabbits and deer; even moths and small rodents are clearly visible at some distance. Some of this information has added to our wider understanding of how protected species use the site.

The Value of Thermal Imaging to the Project
Use of the site by golden plover is a key issue, and the collection of high resolution nocturnal data on the species is therefore an important element of the assessment. Thermal imaging allows this data to be obtained and, when considered together with other survey work being undertaken, it will give confidence in our understanding of how this species uses the site.