

## A study into the effect of light levels on regeneration within an upland ash woodland

*Sam Bristow, date unknown*

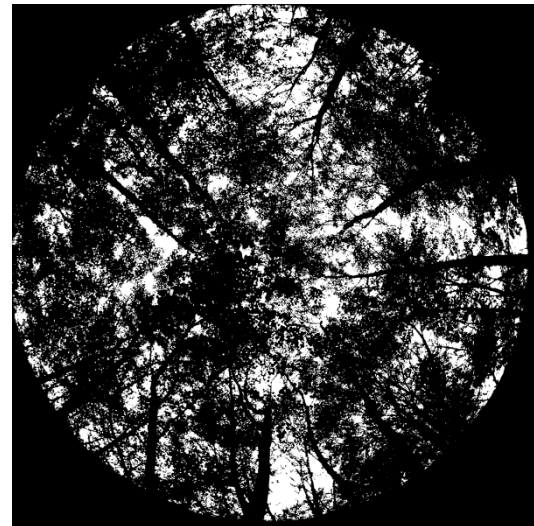
I am in my final year at The University of Cumbria, The National School of Forestry, studying BSc forest and woodland management. For my dissertation I am conducting a study to see how the changing levels of light within an upland ash woodland (NVC W9) affect regeneration.

Changes in levels of light can be measured in various ways. I have chosen to use a digital single lens reflex camera, with a fisheye camera lens that can photograph a 180° scene.

The woodland used was Helbeck Wood, part of the Helbeck Estate, located just north of Brough, Cumbria. It is currently used for the rearing of game birds, showing signs of being relatively undisturbed, with little overall woodland management been conducted, suggesting that the regeneration should be natural.

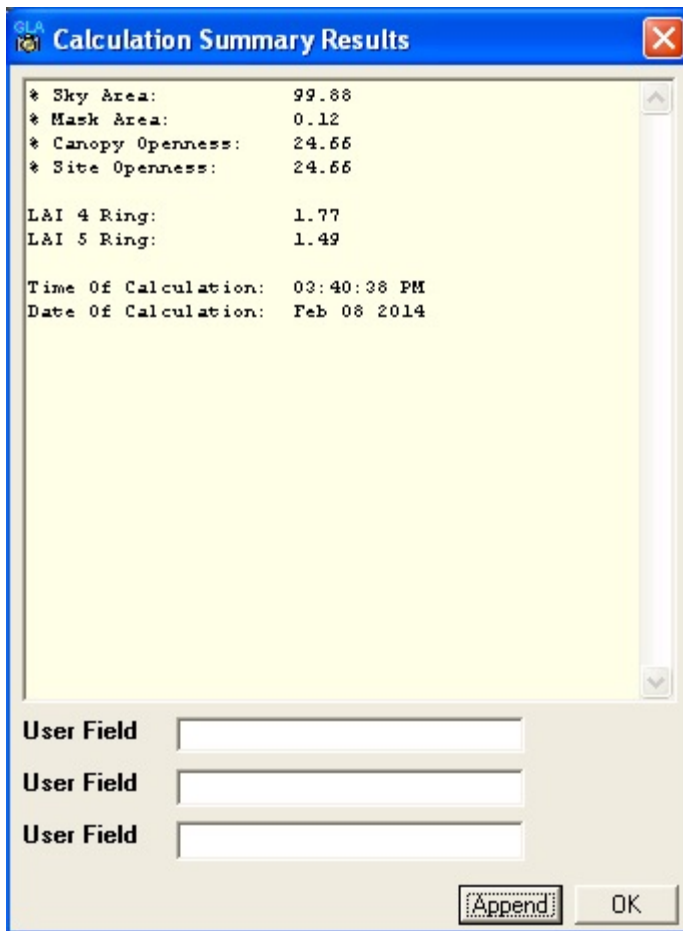
To measure the canopy cover within the sample plots pictures were taken, pointing vertically, with the fisheye lens attached to a Nikon D90. The raw data is then analysed using GLA V2 (gap light analyser), software which breaks down the image, identifying canopy and sky in a contrasting image.

The image on the right is the contrast between canopy and open sky, which enables GLA to



Fisheye image processing

count the number of dark pixels in comparison to the light pixels giving the canopy openness. This then produces an output text box containing a range of information. For this project the only data item needed is the canopy openness figure, which here is 24.66%.



Once all the images for each sample plot have been processed, the regeneration is to be classed into a weighted table, so the larger the regeneration, the greater the weight. This will give an output of the level of regeneration to the openness of the canopy. This will then be used with a linear regression test to see if the data are normal; if not, the data will be used with a non-parametric test.

It is expected to have an outcome of the greater the canopy openness, the greater the regeneration, until the canopy is letting too great a volume of light through, so that species, such as grasses, have a greater advantage, thus leading to the decline in regeneration present.

After the analytical stages of this project are finished, there is to be a final investigation into which species is most likely to recolonise a site like this in the event of the removal of ash. This is to see how the reduction in ash due to *Chalara fraxinea* would affect the change in species present within natural ash-dominated woodland.



Camera set up with Fisheye Lens