

## Conflict and coexistence in the Scottish uplands

### Background and rationale:

The red deer range covers most of the Scottish uplands and populations of these animals need to be controlled to limit grazing impacts on priority habitats. These areas are also increasingly visited by hill-walkers who are attracted to the open landscapes and high mountains, such as the Munros and Corbetts. Both deer management and hill walking are legitimate activities and important to rural economies generating income and rural jobs. However, in some places visitors have the potential to disturb deer which are believed to move away and avoid areas of human activity such as footpaths and tracks. Such disturbance can cause conflicts with deer management objectives affecting the ability to carry out activities such as recreational hunting and managed deer culling. Thus, there is a need to understand the interaction between recreational users (such as hill walkers), red deer movement; as well as the relationship with changing sheep stocking rates.

### Approach:

The project is based in Glen Lyon and aims to monitor the spatial pattern of use by people and red deer taking into account the distribution of livestock and the weather in order to better understand the extent and duration of any displacement of deer by people.

This year we are piloting various approaches including different deer monitoring methods as well as tracking volunteer hill walkers using personal GPS devices. Hill walkers are being asked to carry a small GPS device for the duration of their walk. This is entirely voluntary. Analysis does not require personal contact details and no data will be attributable to individuals. Based on one month of data collection we have had great participation rates from the hill-walkers. In subsequent years the project will be continued by a fully funded PhD student who will also explore novel technological and digital approaches including deer counting using drones and analysis of social media data. The project is overseen by a team of researchers from the James Hutton Institute, Durham University and St Andrews University who have complementary interests in this topic.

### Outcomes and Outputs

Combining fine-scale recreational use data with simultaneous deer observation data is completely novel in the UK context and will be relevant in other contexts where humans interact with wildlife.

We anticipate a range of outcomes that may include:

- A practical tool allowing predictions of both range use and population dynamics to explore how deer distribution is affected by different factors (people, sheep etc).
- An understanding of how hill walker behaviour responds to management information
- An assessment of drone technology for improving the capture of important management information in support of decision making based on adaptive management principles.
- An assessment of the spatial behaviour of hill walkers and a novel approach to scaling up to national level through an analysis of data derived from social media

### Outputs will include

1. Maps and interim reports will be produced at each stage
2. An annual report to funders and key stakeholders and an article submitted to 'Deer'
3. One or more papers published from the PhD thesis in international peer reviewed journals
4. A tool to aid land use decision making and conflict management that includes short and long term disturbance factors.

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