The impact of crofting land management practices on bumblebees in northwest Scotland

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Introduction
- *Bombus distinguendus* is the UK’s rarest bumblebee species and a UK BAP species
- Their current distribution is limited to crofted landscapes in northern Scotland
- The Outer Hebrides are an important stronghold for the species and their distribution closely reflects that of the machair habitats on the west coast of these islands
- Traditional crofting practices are thought to maintain populations of *B. distinguendus* and other bumblebee species
- However, quantitative evidence examining the value of croft land to bumblebees is currently lacking
- In this paper we examine the impacts of croft land management practices on the abundance of bumblebees and their key forage plants in northwest Scotland

Methods
- 31 crofts belonging to 10 crofters were surveyed throughout North & South Uist, Harris, Lewis and Durness
- Fieldwork was conducted between June and August 2008
- Bumblebee walks were carried out on all management types present on each croft and the number of foraging bees and their forage plants were recorded
- Vegetation surveys were carried out along the length of all bumblebee walks. A 0.5m x 0.5m quadrat was placed every 50m metres and the number of inflorescences recorded
- Each croft was surveyed three times for foraging bumblebees and flowers, once in each month: June, July & August
- Management type, livestock and livestock numbers were also recorded

Results
- Croft land management practices had a significant negative effect on bumblebee abundance in all months (June: $\chi^2 = 18.24, p = 0.0101$; July: $\chi^2 = 109.74, p < 0.0001$; Aug: $\chi^2 = 71.76 , p < 0.0001$ ) (Fig.1)
- Management also had a significant effect on the abundance of bumblebee forage: (June: $\chi^2 = 25.14, p = 0.0007$; July $\chi^2 = 17.82, p = 0.0128$; Aug: $\chi^2 = 5.56, p = 0.5921$)
- Only 246 bumblebees were recorded foraging on croft land, much fewer than recorded in similar studies
- Silage, fallow and Bird & Bumblebee conservation seed mix (B&B mix) were the most beneficial management practices for foraging bumblebees
- Sheep grazing during the summer had a significant negative effect on bumblebee abundance (June: $w = 2182.0, p = 0.02$; July: $w = 1782.5, p = 0.006$; August: $w = 2126.0, p <0.0001$)

Conclusion
- Only 5 species of forage plants were used most frequently by foraging bumblebees. Species belonging to the Fabaceae family were particularly important

Fig. 1. Box plots showing fitted values from the models for bumblebee abundance across eight different croft management types in June, July and August respectively. Boxes represent the location of the middle 50 percent of the data and the whiskers indicate the interquartile range of the data.

Further Information

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