

# Grazing Impacts on Upland Biodiversity



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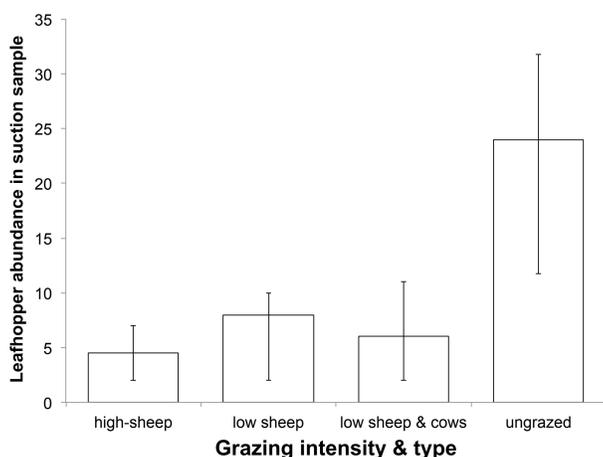
## Background

- Sheep numbers in Scotland are in decline (from 10 million in 1998 to less than 7 million in 2011).
- Many upland estates have abandoned sheep farming or significantly reduced their flock size.
- Cattle grazing in upland areas is at much lower levels than it was historically.
- Meadow Pipits are in significant long-term decline in Scotland.



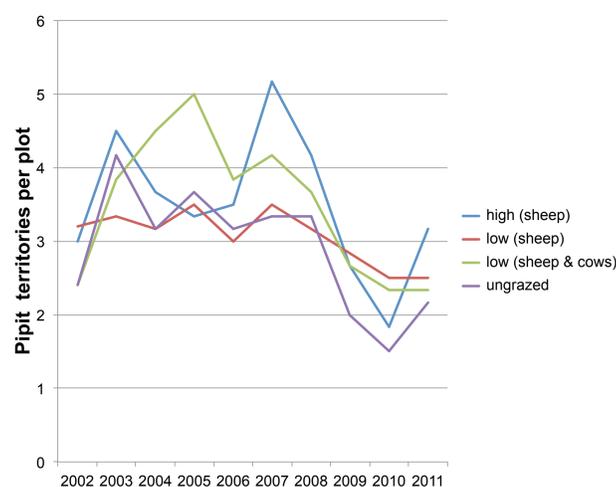
## The Experiment

- Located at Glen Finglas, in the Loch Lomond & The Trossachs National Park.
- Four grazing treatments, each replicated six times.
- Established 2002/03.
- Plants, invertebrates and Meadow Pipits studied annually.



## Plant and Invertebrate abundance

- Vegetation height and leaf-litter accumulation increase with decreased grazing intensity.
- Most invertebrate groups decline in abundance and biomass with increased grazing<sup>1</sup>.
- In ungrazed plots, some invertebrates (e.g. leafhoppers, left<sup>2</sup>) are most abundant deep within the dense accumulated leaf-litter.



## Pipit responses

- Meadow Pipits forage more efficiently in shorter vegetation (grazed plots)<sup>3,4</sup>.
- Longer vegetation (ungrazed plots) impedes the pipit's ability to find food.
- In recent years, breeding pipit numbers have been lowest in the ungrazed plots (left).

## References

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## Key points

- Grazing abandonment produces tall vegetation and a build-up of leaf litter.
- Insects are more abundant in ungrazed areas but pipits are unable to forage here effectively.
- Reduction and abandonment of upland grazing may contribute to the decline in breeding pipits in Scotland.
- A decline in pipit numbers may impact on other biodiversity, e.g. birds of prey.