



COLLABORATION FOR ENVIRONMENTAL EVIDENCE

SYSTEMATIC REVIEW No. 14

HOW DOES THE IMPACT OF GRAZING ON HEATHLAND COMPARE WITH OTHER MANAGEMENT METHODS?

REVIEW REPORT

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COVER SHEET

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SYSTEMATIC REVIEW SUMMARY

Background

Lowland heathland is a priority habitat for nature conservation throughout north-west Europe. One of the most important causes of the loss of heathland habitat has been a widespread decline in 'traditional' use of heathlands, which included light grazing, controlled burning and cutting of vegetation for use as fuel and animal fodder. As a result, many heathlands have reverted to scrub or woodland through a process of natural succession. Current management responses to this problem include the use of fire, cutting of vegetation and reintroduction of grazing. Although reviews and guidelines for the management of lowland heath exist, few attempts have been made to compare grazing with alternative management approaches, such as cutting or burning. This highlights the need for a critical review of the evidence, to identify the conditions under which grazing is likely to be most effective as a management approach, and to determine the relative impacts of grazing compared to alternative management interventions.

Objectives

To ascertain:

- How the impact of grazing on heathland compare with the impact of burning, cutting or no management?
- The effect of timing, extent, frequency, severity, and nature of grazing, cutting or burning on their relative impacts?

Search strategy

Electronic databases and web sites were searched using key words. Bibliographies were also searched and researchers were contacted to retrieve relevant material. Heathland manager experience was collated using a questionnaire survey.

Selection criteria

For the systematic literature search, studies or data were included in the review where the following criteria were met:

1. *Subject*: lowland heath (<200 m altitude).
2. *Intervention*: grazing, burning, cutting or no management.
3. *Outcomes*: Relevant outcomes are amount and type of bare ground; cover of ericoid dwarf shrubs and *Empetrum* or *Ulex* species; cover of pioneer, building, mature, degenerate and dead *Calluna/Erica* spp. and growth form of *Calluna*; cover of graminoids; cover of forbs; cover of bryophytes and lichens; cover of miscellaneous species which have negative conservation value if present above target thresholds; amount and type of scrub.
4. *Comparators*: Comparators (before and after or treatment and control) were required for studies to be included in meta-analytical synthesis.

Data collection and analysis

Study inclusion assessments were performed and the observed agreement between independent reviewers was “substantial” indicating that the relevance assessment was repeatable. Sufficient data existed to derive ratios comparing grass cover to ericoid cover and these were combined using random effects meta-analysis. Other outcomes were tabulated. Additional information collected included a questionnaire survey of heathland managers.

Main results

Despite the apparently large literature available on this topic, there is limited empirical evidence regarding the relative impacts of burning, grazing and cutting on lowland heath. Of 3431 references identified with potentially relevant titles and abstracts, 92 (<3%) were found to be relevant to management of lowland heath. A further 177 references were identified by searching the web (using search engines, web pages, WOS, EN files, RSPB files) and bibliographies of relevant material.

Only 13 of these had appropriate comparators; three examined the impacts of burning, three examined vegetation cutting, four examined grazing, and a further three examined the impacts of grazing and burning or cutting in combination.

Best available evidence indicates that grazing increases the ratio of graminoid plants relative to ericaceous dwarf shrubs. There is considerable variation in the impact of grazing, burning and cutting, and this variation is unexplained. Furthermore, it is not clear from these data, how grazing, burning and cutting compare in terms of their impact on vegetation and other outcome measures.

Reviewers' Conclusions

- **Implications for conservation management:** Available evidence from meta-analysis suggests that grazing can result in an increase in the ratio of graminoids to ericoids on heathlands. However, there is very little evidence available on the relative impacts of burning, grazing and cutting on lowland heath. Evidence from studies excluded from meta-analysis because of the lack of a comparator, and the beliefs of heathland managers elicited using a questionnaire, suggest that negative impacts of grazing on some habitat attributes are widespread. However overall, a large majority of respondents (94%) believed that grazing has been effective in meeting at least one management objective. Monitoring the impacts of interventions before and after implementation and further experimentation are necessary in order to develop a robust evidence base regarding the relative impacts of these interventions.
- **Implications for further research:** Further research regarding the effects of heathland management is urgently required if a robust evidence-base is desired. Studies should include comparator(s) and baselines wherever possible. Replication should be accorded higher value than has been traditional as 70% of existing ‘high’ quality information lacks statistical significance owing to large variance and small sample sizes.