

## Management of grasslands used by waders: integrating time and key spatial scales of grazing processes

M. Tichit<sup>1</sup>, D. Durant<sup>2</sup>, O. Renault<sup>3</sup> and E. Kernéis<sup>2</sup>

<sup>1</sup>UMR INRA SAD APT-INAPG, 16 rue Claude Bernard, 75231 Paris cedex 05, France, Email: tichit@inapg.fr,

<sup>2</sup>Domaine INRA SAD, 17450 Saint-Laurent de la Prée, France, <sup>3</sup>Chaire d'Ecologie des Populations et Communautés, INAPG, 16 rue Claude Bernard, 75231 Paris, France

**Keywords:** breeding waders, grazing, spatial scales, timing

**Introduction** Agriculture has many functions. Mainly through agri-environment schemes, farmers are asked to manage grasslands of special value to conserve biodiversity. Assessment of grazing as an ecological factor of variation of grassland characteristics is needed to understand how grazing contributes to grassland management for species conservation. Several wader species use wet grasslands preferentially for nesting and foraging. Like many ground-nesting birds, they are very sensitive to the sward structure (see Durant *et al.*, this congress).

**Dynamic interactions** We must understand the nature of dynamic interactions between grazing processes and wader preference of for certain sward structures. Different species select different sward structure and their timing of breeding varies. Therefore different grazing regimes are likely to be needed at different critical periods. On the basis of previous research, we propose some thoughts to guide future work on this subject, according to two main questions: (1) Does grassland suitability to the species depend on timing and intensity of grazing? (2) What influence has grassland distribution on its suitability as a bird habitat?

**Integrating timing and intensity of grazing and key spatial scales** *Timing and intensity of grazing:* Niche differentiation between species exists as regards grazing intensity, which is a critical influence on habitat suitability (Tichit *et al.*, 2004). For example, intense autumn grazing improves suitability as a lapwing habitat. The needs of curlew and redshank contrast sharply to that. Curlews and redshanks select fields with a spring grazing intensity above and below average, respectively. Thus, conflicts of interest may emerge from particular grazing regimes being adopted for the conservation of certain species. Also, nest-trampling influences breeding success. Mitigation of those negative effects related to livestock density may require a subtle trade-off. There is need to investigate a 'threshold date', before which grazing may have detrimental effects. Also, the delayed effects of autumn grazing (Tichit *et al.*, this congress) should be considered as a way to increase the attractiveness of fields for lapwings in the following spring. *Key spatial scales:* Because species-environment relationships operate at field and coarser scales, such as the landscape scale, we contend that grassland management should take into account several spatial scales of observation. The definition of these scales should be made from the spatial resolution of bird behaviour and should be based on relevant ecological traits of breeding waders (for example, home range size). Modelling habitat suitability for 5 wader species, we showed that habitat preferences are not built on the same ecogeographical variables for all species (Renault *et al.*, 2004). Two groups of birds need consideration. Group 1 (migratory species, like lapwing and black-tailed godwit) is very sensitive to landscape variables (distance to water, distance to mowed pastures). Group 2 (nesting species, like lapwing and redshank), is attracted more by land use at field scale instead. At the landscape scale, we showed that birds are distributed non-randomly and that some sectors of the marsh are more attractive than others. Therefore, studies should integrate at least 3 spatial scales: **•Field scale:** Mean grass height and heterogeneity, which depend on grass growth and grazing intensity, are crucial in the choice of nest site in breeding waders (Durant *et al.*, this congress). **•Scale of a block of a few adjacent fields:** This scale is defined by the spatial resolution of the distribution of birds in the breeding season: breeding birds usually are not restricted to a single field, but move from one field to another. This supports the idea that it is important to take field surroundings into account. **•Landscape scale:** Landscape may provide clues used by birds for habitat selection. For example, the proportion of grazed pastures in the landscape probably explains its degree of use by waders.

**Conclusions** Increasing evidence advocates the importance of maintaining a some heterogeneity in agricultural landscapes in time and at various spatial scales. The management of heterogeneity at those multiple scales results from several farmers acting according to their own purpose. We conjecture that coordination between farmers may be crucial to improve bird habitat conservation through grazing practices.

### References

- Renault, O., T. Potter & M. Tichit (2004). Variability of suitable habitats for waders: does grazing management help? 55<sup>th</sup> Meeting of European Association for Animal Production, Bled, 5-8 September 2004. [http://www.eaap.org/bled/LNCS2\\_06.htm](http://www.eaap.org/bled/LNCS2_06.htm)
- Tichit, M., T. Potter & O. Renault (2004). Grazing intensity as a tool to assess positive side effects of livestock farming systems on wading birds. 55<sup>th</sup> Meeting of European Association for Animal Production, Bled, 5-8 September 2004. [http://www.eaap.org/bled/LPM3\\_13.htm](http://www.eaap.org/bled/LPM3_13.htm)