Grazing to Improve Wader Habitat on Alkaline Meadows in Eastern Austria

Bernhard Kohler & Georg Rauer

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Berhard Kohler, Engerthstr. 230/19/16, 1020 Wien, Austria; Georg Rauer, Badnerstr. 23, 2540 Bad Vöslau, Austria.

Austria has only small populations of waders breeding in wet meadows: about 200 pairs of Redshank *Tringa totanus*, 50-150 pairs of Black-tailed Godwit *Limosa limosa*, 50-60 pairs of Curlew *Numenius arquata* and about 1500 pairs of Lawping *Vanellus vanellus*. The most important breeding concentrations are found east of Lake Neusiedl in the Seewinkel. This area is the westernmost outpost of the Hungarian puszta, a landscape which is reminiscent of the true East European steppes. Broadly speaking there are two types of semi-natural vegetation: 1. a steppe-like vegetation ('secondary steppe') on tschernosem soils or on former sand dunes, not only the result of climatic and pedological factors but formed through centuries of extensive grazing: 2) a specialized halophytic flora on very alkaline temporarily flooded soils. The alkaline meadows cover a total of 25 km^2 and most often surround shallow alkaline lakes, which are scattered over the whole area. The (former) pastures and alkaline lakes support a breeding community of waders composed of Stone Curlew *Burhinus oedicnemus*, Black-tailed Godwit, Lawping, Kentish Plover *Charadrius alexandrinus*, Little Ringed Plover *Charadrius dubius* and Avocet *Recurvirostra avosetta*. Furthermore the area is an important inland staging post for migrating waders - a total of 24 species of which Ruff *Philomachus pugnax* (up to 1600), Black-tailed Godwit (up to 900), Curlew (up to 450), Spotted Redshank *Tringa erythropus* (up to 200), Dunlin *Calidris alpina* (up to 500) and Little Stint *Calidris minuta* (up to 350) occur in larger numbers (Kohler & Rauer 1989).

During the last 100 years there have been dramatic losses of habitat due to conversion of dry pastures into agricultural land and due to drainage and subsequent improvement of some alkaline soils. The last wave of conversion took place after the second world war and was completed in the 1960s. At that time grazing stopped almost completely on the remaining pastures, partly because some of them were declared as strict nature reserves and mostly because the traditional way of grazing was no longer profitable to the landowners. In fact, they continued to use many of the unprotected meadows as hayland for their livestock now kept in stables. The vegetation of the abandoned pastures including the lake shores began to change dramatically. It became generally denser and higher, but the most obvious change was a rapid spread of the Reed *Phragmites australis* along the lake shores and into the wet meadows. Especially the *Juncus gerardii* meadows representing an important part of the wet grassland in the Seewinkel area were readily invaded by *Phragmites*.The shorelines of many lakes (*e.g.* Kirchsee, Illmitzer Zicksee, Lange Lacke) which are known to have been almost bare in 1940 (Zimmermann 1944), are now covered (60-80 %) by tall reeds. Of course these changes in the vegetation are not due to the lack of grazing alone. Drainage and eutrophication from the surrounding agricultural land contribute heavily to this problem, but these impacts are not yet quantified. Most probably as a result of these changes the Stone Curlew has disappeared as a breeding bird from this area. The population of the Kentish Plover, which numbered about 80 pairs in the 1940s dropped to only 20 pairs today. The breeding populations of the other wader species mentioned above seem to show no decline as yet, although information on their former status is limited.

Recently the management policies for the nature reserves have been changed. Fighting eutrophication and raising the water levels are certainly the most urgent tasks, but, in the vicinity of intensively used agricultural land, very compli-

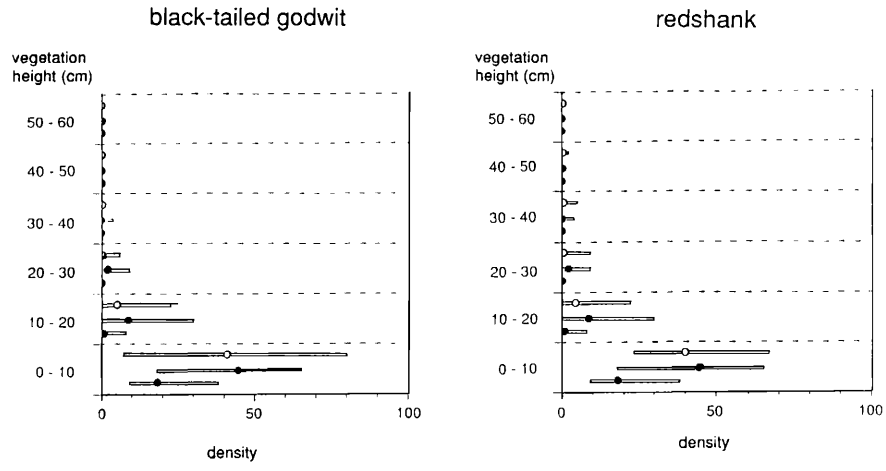

Figure 1. Mean vegetation density (median and range) in vertical intervals of 10 cm measured as the percentage of white panel concealed by a strip of vegetation 20 cm wide. Full circles: new grazing area (recorded on 1-2 April and 18-20 May 1989 in 18 and 13 sampling plots respectively; 10 measurements per plot); open circles: chick rearing territories in the time between 13 April and 17 May 1988; n=13 and n=16 respectively; 7 measurements per territory).

cated ones too. The reintroduction of grazing was considered therefore as one possible way of dealing with changes in vegetation structure and especially with the spread of the reed. In 1987 a small herd of cattle (25 head at the beginning, but the number is increasing from year to year) was established in one reserve of about 10 ha around one of the larger lakes (Illmitzer Zicksee). Our work since then has been to gain experience with the reintroduction of grazing and with the numerous technical problems arising from it. A major part of our work has been to search for future management sites. This has meant in practice, apart from the collection of information on land use patterns and the ownership situation, the mapping of the vegetation on large areas not so much from a botanical point of view but rather with the intention of detecting areas which might be improved for waders by grazing (or mowing). Our interest focused on plant communities which in a mown (or grazed) state are known to support high wader densities, and which in unmanaged situations are quickly invaded by reeds (*e.g. Juncus gerardi* meadows). In the beginning we could do very little research on the birds themselves and therefore we are still at the beginning of a thorough investigation of the two main questions: to what extent does grazing create a habitat structure favourable for breeding waders? and what sort of regulation is necessary to keep the detrimental consequences of grazing (*e.g.* nest losses through trampling) at a tolerable level?

To define possible aims for the control of habitat characteristics by grazing activities we recorded data on the vegetation structure and other habitat features, in breeding and chick rearing territories of two species breeding in grassland, the Redshank and the Black-tailed Godwit, and two species breeding on the shores of the shallow lakes, the Little Ringed Plover and the Kentish Plover. The features considered were vegetation height, vegetation density in different layers, ground cover, presence of tussocks, proportion of forbs, the presence of reed and the plant community involved, as well as the the moisture of the soil and the distance to open water. In the case of the plovers we recorded also the amount of gravel on the bare soil. The same measurements were taken on the new grazing areas. Figure 1 gives an example for the kind of conclusions which can be drawn from these data. The comparision of the mean vegetation density on the new pasture and in the chick rearing territories of Redshank and Black-tailed Godwit (measured mainly on mown or unmanaged sites) indicates that on the alkaline meadows already a very low cattle density of half an animal/ha will be sufficient to maintain a suitable vegetation structure.

Extensive literature on the interaction between cattle and breeding birds exists and also some recommendations on acceptable cattle densities on wader breeding sites (*e.g.* Beintema *et al.* 1982; Beintema & Müskens 1987; Ziesemer 1982). We have the problem that these results cannot be directly applied to our situation because of the special kind of pasturing in the Seewinkel. In contrast to practise in The Netherlands, Great Britain or Germany there are no fenced enclosures where the cows are kept to graze (only a small one for the hours of rest).

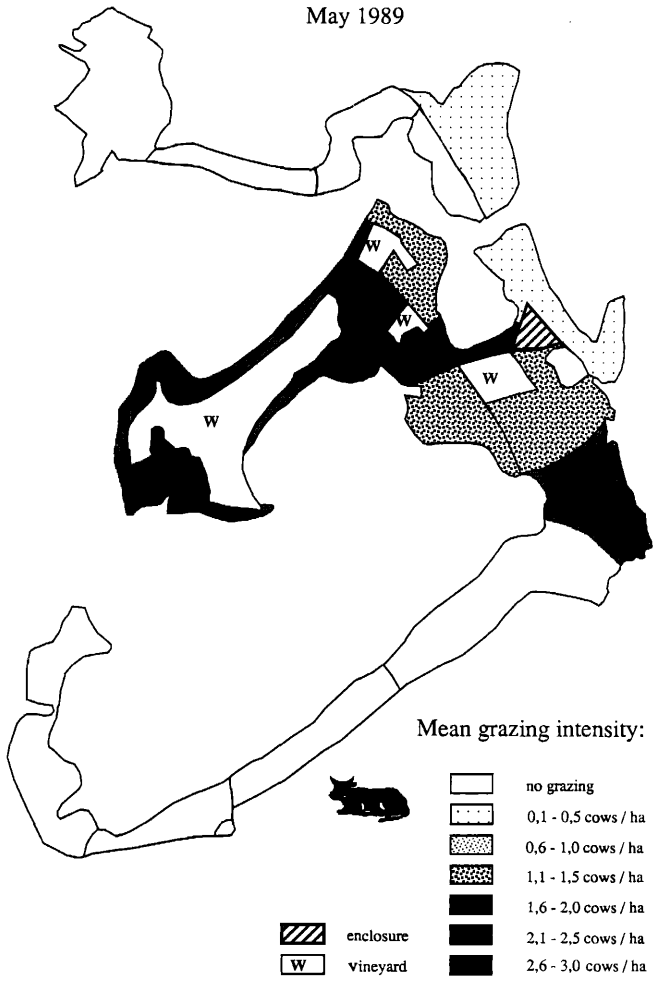

Figure 2. Mean grazing intensity on different parts of the pasture in May 1989 (size of the herd about 60 heads).

Due to the low productivity of the alkaline grassland the cows have to be led over rather large expanses of pastureland during a grazing season. They are guarded by a herdsman and a dog. The traditional grazing season starts at the beginning of May and ends at the end of October. In this kind of grazing regime different parts of the pasture are very unevenly used. During a given period of time some areas may not be visited at all while others suffer high densities (Figure 2). Especially when the herd is driven *e.g.* from the resting enclosure to a more distant foraging site, very high densities occur locally for a short time. On the other hand this system allows also some amount of planning, provided that the birds' distribution and densities are known. A major constraint for this planning, however, is the arrangement in space of the potential grazing areas.

So far we do not have any reliable data on the amount of nest losses under this sort of grazing management. We still have to rely therefore on the results of, for example, Dutch and British investigations to evaluate the impact of the cattle herd on the breeding success of the birds in our pasture. Figure 2 shows the mean cattle densities on different parts of the pasture in spring 1989 calculated from the 'logbook' of the herdsman. Assuming that densities in excess of half an animal per ha may be detrimental to breeding waders, we can state that a herd large enough to improve wader habitat on the whole reserve puts at risk the birds breeding on about one third of the total area. Whether this is tolerable from the populations' point of view remains to be investigated.

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