

The effect of introducing cattle grazing to saltmarsh on densities of breeding redshank *Tringa totanus* at Frampton Marsh RSPB Reserve, Lincolnshire, England

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SUMMARY

The effects of introducing cattle grazing to a saltmarsh on breeding redshank *Tringa totanus* were investigated. The density of breeding redshank did not noticeable change after introduction of grazing.

BACKGROUND

Great Britain supports approximately 18% of north-western Europe's breeding redshank *Tringa totanus* population with an estimated 45% in Britain breeding on saltmarsh (Brindley *et al.* 1998). Surveys showed that densities of breeding redshank on saltmarshes in Britain declined by 23% between 1985 and 1996 (Norris *et al.* 1998). Modelling of redshank breeding densities in relation to livestock grazing densities found the highest breeding densities tended to occur on lightly cattle-grazed, sea couch-grass *Elymus pycnanthus* dominated saltmarsh (Norris *et al.* 1997).

This study suggested that summer grazing should be re-introduced to upper sea couch-grass dominated saltmarsh around The Wash estuary (eastern England), at a stocking rate of approximately one cow per hectare to benefit breeding redshank. A lower stocking level was suggested for sites dominated by lower saltmarsh. The effects of introduction of cattle grazing on breeding redshank densities on a saltmarsh nature reserve located on The Wash coastline were investigated.

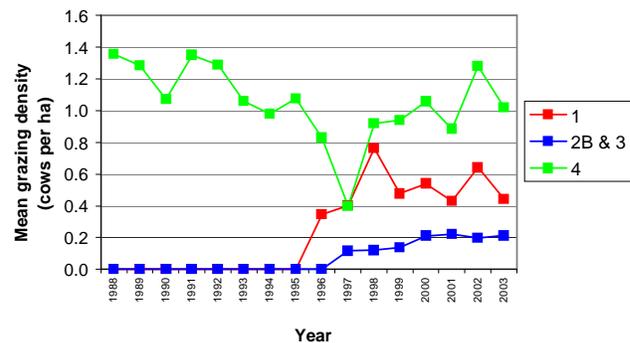


Figure 1. Cattle densities on areas of grazed saltmarsh at Frampton Marsh RSPB Reserve. Values are the mean number of cows/ha from 15 April to 31 October. 1988-2003.

ACTION

Study area: The grazing experiment was undertaken at Frampton Marsh RSPB Reserve (National Grid ref: TF 365375) situated on the southwest corner of the Wash estuary, Lincolnshire, eastern England. In the early 1990s one block of saltmarsh was already being grazed by cattle, while three others remained un-grazed. The saltmarsh in this area comprised middle and upper marsh dominated by sea couch-grass, common saltmarsh-grass *Puccinellia maritima* and sea purslane *Halimione portulacoides*. Grazing was introduced to two of these formerly un-grazed blocks of saltmarsh in 1996 and 1997. A primary aim of this grazing was to provide suitable breeding conditions for redshank.

Table 1. Areas grazing units and redshank monitoring plots within them.

Grazing regime	Grazing unit			
	1 Medium (grazing introduced in 1996)	2A Un-grazed	2B & 3 Light (grazing introduced in 1997)	4 Continual heavy grazing
Total area of grazing unit (ha)	62.9	47.8	109.5	70
Area of redshank monitoring plot(s) (ha)	16.0	14.5	50.0	31.5

Grazing densities: The grazing densities introduced were lower than the density of one cow per ha suggested by Norris *et al* (1997). This was partly because these densities were considered too high, but also because it was thought best to take a precautionary approach when introducing grazing to formerly un-grazed areas of saltmarsh. The existing grazed saltmarsh continued to be grazed at similar levels to in the early 1990s. The grazing unit and redshank monitoring plot areas (ha) within the grazing blocks are shown in Table 1. The densities of cattle within each grazing unit are shown in Figure 1. Densities of cattle are described in terms of the mean number of cows per ha during the periods 15 April to 31 October. It was considered that maintaining this range of different regimes on the saltmarsh would at least provide a range of different conditions for their flora and fauna. Grazing generally took place between mid-April and October inclusive.

Redshank monitoring: Numbers of breeding redshank were monitored on plots within the different grazing blocks. Numbers of breeding redshank were estimated by calculating the mean number of birds recorded during two survey visits between mid-April and 31 May, excluding birds in flocks. This figure was divided by two to provide an estimate of breeding pairs (Brindley *et al.* 1998). All plots were surveyed by the same observer in each year (1992-2004). To help determine any effects of introducing grazing on breeding redshank densities, densities of breeding redshank were also calculated relative to the mean of those on the consistently grazed saltmarsh (Compartment 4) and the consistently un-grazed saltmarsh (Compartment 2A). This would help control for any annual changes in density on the blocks to which grazing was introduced due to

annual differences in recorded numbers due to changes in redshank numbers in the general area or due to any potential observer bias.

CONSEQUENCES

There have been no noticeable changes in the estimated densities of breeding redshank in blocks to which grazing has been introduced relative to those in the consistently grazed and consistently un-grazed areas of saltmarsh (Fig. 2). Densities of breeding redshank in the differently grazed saltmarsh blocks over the period 1998 to 2004 (i.e. during the period when the current grazing regimes had been in place for at least a year) are compared in Table 2. The only significant differences in estimated breeding densities in the different grazing units since 1998 is that the unit to which light grazing was introduced in 1997 had a significantly lower density of breeding redshank than the un-grazed unit.

There are several possible reasons for a lack of any measurable effect of grazing on redshank.

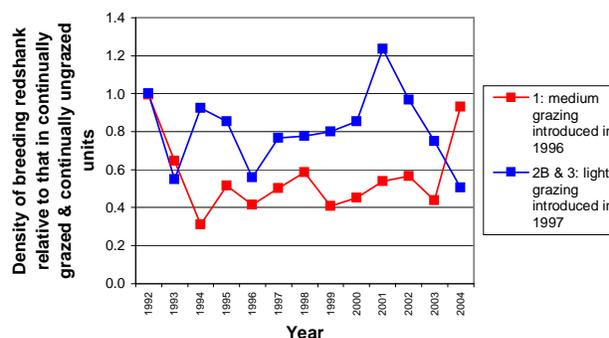


Figure 2. Estimated breeding redshank densities in monitoring plots in units to which grazing was introduced relative to those on continually grazed or un-grazed units.

Table 2. Estimated densities of breeding redshank in the monitoring plots in the different grazing units. Values are means \pm one standard error for the period 1998-2004 inclusive. Means with different superscripts differ significantly from each other (Tukey test, $P < 0.05$).

	Grazing unit and grazing regime				F	P
	1: medium grazing introduced in 1996	2A: un-grazed	2B & 3: light grazing introduced in 1997	4: continual heavy grazing		
Density of breeding redshank (pairs per ha)	0.70 \pm 0.07 ^{ab}	0.83 \pm 0.16 ^a	0.38 \pm 0.07 ^b	0.59 \pm 0.04 ^{ab}	7.56	0.002

It is possible that the monitoring plots were not representative of the areas of saltmarsh being grazed and that the survey methods do not provide precise enough results to measure potential changes in breeding redshank density. The results do though suggest that the introduction of grazing at these levels has had at most only a negligible effect on densities of breeding redshank.

The way that grazing is thought to benefit breeding redshank on middle and upper saltmarsh is by providing a suitable mix of vegetation height and structure. It is possible that such a mosaic of suitable conditions already exist on the saltmarsh at Frampton and that introduction of grazing did little to improve this. It is also possible that the cattle concentrated feeding on areas that were intrinsically less suitable for nesting redshank, for example in areas close to the sea walls.

REFERENCES

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