



Habitat improvements with agronomic treatments for ungulates in an area of central Italy



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INTRODUCTION

In recent years, in many European countries the abandonment of traditional agricultural practices produced remarkable effects in marginal lands, this is causing deep changes in plant component that result in a marked increase in shrubs and woodland areas that replace open spaces. This leads to a significant decrease in floristic richness and biodiversity particularly important within a natural reserve, as open areas are essential for many wild animals.

THE AIM

The research was conducted to evaluate the effectiveness of two different environmental improvements in order to recover areas encroached by *Pteridium aquilinum* for wildlife in Tuscany.

MATERIALS AND METHODS

The study area is located within the Natural Reserve of Acquerino-Cantagallo in northern Italian Apennines (Tuscany). Three open areas were identified, once used as pasture and now encroached mainly by bracken fern and forest species that have invaded the open areas from the edge of the surrounding woods. In the trial sites two types of action were conducted in spring 2008 for environmental improvement: simple cutting and harrowing of the surface followed by the sowing of a mixture of two grasses (*Dactylis glomerata* L. and *Lolium perenne* L.). This management was proposed and realized by the administration of the Natural Reserve. Pasture evolution was observed during 2009, by means of linear analysis to evaluate botanical composition, pastoral value and biodiversity

- Botanical composition was recorded according to Daget and Poissonet method

- Pastoral value (PV) was calculated using the formula:

$$PV = \sum (SC_i \times SI_i) / 5 \quad \text{where: } SC = \text{specific contribution}$$

$SI = \text{specific index, that summarizes the forage value of each species.}$

- Floristic biodiversity was evaluated using the Shannon –Wiener index (H'): $H' = -\sum p_i \ln p_i$

where p_i is the percentage presence of each species expressed in decimal fraction

RESULTS

Number of grasses (sown and native) in the improved areas was higher than natural surfaces (Fig. 1, A), as number of legumes differed from natural areas only in the sown sectors. Species of these botanical families are generally characterized by a good palatability by animals. Number of forbs is significantly lower under the sowed treatment in comparison to natural areas. The analysis of the specific contributions (Fig. 1, B) confirmed the increased presence of grasses and legumes in the improved areas compared to the natural surfaces, with no significant differences between the two types of management. Other botanical families are better represented in not improved areas, which are in general characterized by high presence of forbs, of low or no interest for animals, such as *Pteridium aquilinum*. Areas subjected to

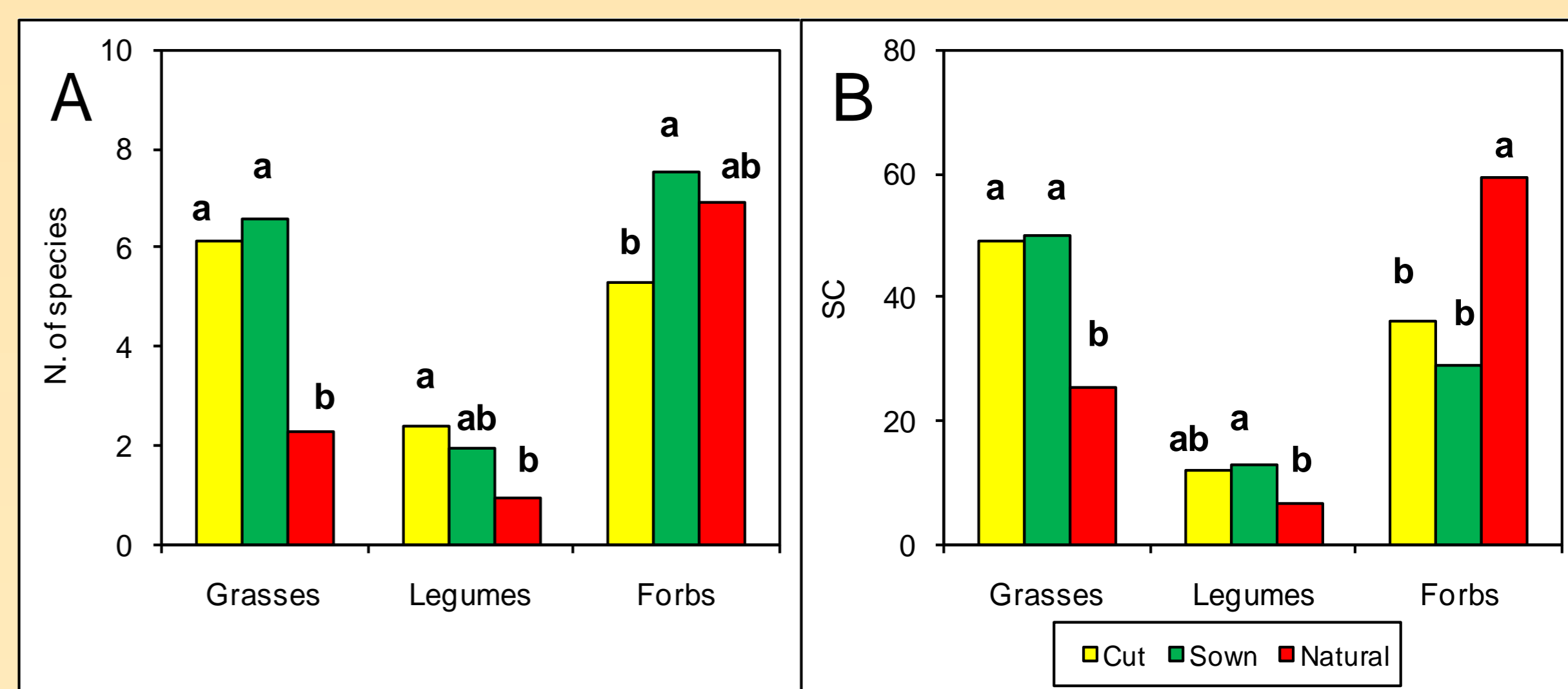


Fig 1. Number of species (A) and specific contribution (B) grouped for grasses, legumes and forbs for each studied treatment.

Parameter	Treatment		
	Sown	Cut	Natural
PV	31 a	24 a	7 b
R	14 a	16 a	10 b
H'	2.3 a	2.3 a	1.7 b
SC <i>Pteridium aquilinum</i>	5,7 b	4.2 b	35.9 a

Tab 1. Pastoral value (PV), floristic richness (R), Shannon index (H') and specific contribution of *Pteridium aquilinum* for each studied treatment

agronomical managements are characterised by a higher pastoral value in comparison to surrounding natural areas, in which high occurrence of species of low pastoral interest affected significantly this parameter (Tab. 1). Sowing, compared to mowing, produced the same effects in terms of improving the global characteristics of the pasture, as no significant differences were observed for pastoral value in sown and cut areas. Also a significant increasing of floristic richness (R) and biodiversity (H') were observed in improved areas in comparison to natural areas.

CONCLUSIONS

The results demonstrated the efficiency of habitat improvements in the first years after the agronomical interventions with a remarkable reduction of bracken fern and shrub species and have not been highlighted significantly differences between simple cut or harrow. The reduction of *Pteridium aquilinum* produced also ecological benefits in terms of biodiversity and of recovery of pastoral surface for wildlife fauna.