



Linking livestock production and wild biodiversity: Contribution of pastoral production systems to the habitat of bird priority conservation species.

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Abstract. Livestock production is being questioned for its greenhouse gas emissions. However, production systems influence multiple environmental variables and, in some cases, contribute to very valuable environmental services. This work summarizes information collected at 30 livestock production farms and four INIAs experimental fields allocated throughout the Uruguayan territory. A total of 231 bird species were recorded, 42 of them identified like priority conservation species. Of these species 10 are included in UICN lists and 19 in Uruguayan Red List. We conclude that livestock production system based on natural grasslands are very rich ecosystem in term of bird species. Traditional management provides suitable habitat for several priority conservation species. However, several species, mainly tall-grass dependents, need special management measures.

Keywords: Sustainability, extensive production, environment management, grazing management.

1 Introduction

At a global level, livestock production is being questioned for its greenhouse gas emissions, however, production systems influence multiple environmental variables and, in some cases, contribute to very valuable environmental services. Extensive livestock systems based on natural grasslands are one of the few production systems that can obtain ecosystem services of provision (meat, wool and leather) without substituting natural communities with crops or pastures. The present work tries to show the contribution of extensive livestock production systems to sustain habitat for conservation priority species in Uruguay

2 Methods or Materials

This work summarizes data collected at 30 livestock production farms and 4 INIAs experimental fields distributed throughout the Uruguayan territory (figure 1), participants of 7 projects carried out for 14 years.



Fig. 1. Uruguay in the regional context and localization of study sites.

The farms range between 18 and 5500 hectares; sampling was done by seasonal transects with lengths between 300 and 3000 m, point sampling for 15 minutes or listing methods. Sampling periods last from two to four years (table 1). In transects, bird species and number of individuals were recorded. The presence of the species using habitat within the limits of the farms was considered, understanding as presence those that were registered a minimum of three times in each farm. In the present work richness and priority conservation species [2] are considered. The priority is defined by nine criteria: (1) Global threatened species according to the IUCN Red List, (2) Native species of Uruguay whose global distribution does not exceed 175,000 km², (3) Migratory species that use part of the national territory at some stage of their annual cycle, with a fraction > 10% of their global or biogeographical population present in Uruguay, (4) Species with a restricted distribution area in Uruguay (less than 10% of the territory), (5) Species that have suffered a significant decrease in their national population size. (6) Unique species from the taxonomic point of view (unique of a family or order, unique species of a genus in the world) and / or ecological (outstanding role in ecosystem functioning) with conservation problems. (7) Species with cultural and / or economic value (current or potential) with conservation problems, (8) Rare species (but of regular presence) with conservation problems and (9) Threatened species at the national level according to the Red List of Birds Uruguay [1].

3 Results (Times New Roman 12)

A total of 231 bird species were recorded, 42 of them are priority conservation species. Ten of these species are included in UICN and 19 in Uruguayan Red List. In table 1, farms and sampling characteristics, richness and priority species are displayed.

Table 1. Area, sampling characteristics, richness and priority species by study site.

Farm	Area (ha)	N° of transects or points of sampling	Tresect length (m) point sampling duration (minutes)	Number of visits	Duration (years)	Richnes	Priority species
1	37	2	900/900	8	3	45	4
2	18	2	15 min	10	3	53	6
3	130	2	900/900	8	3	56	8
4	178	1	1200	12	3	53	6
5	764	3	900/1200/1500	15	3	94	8
6	427	3	1200/1200/1200	15	3	88	8
7	859	2	1200/1800	10	3	75	10
8	665	2	1500/1800	11	3	94	8
9	879	3	900/1500/1800	8	3	79	8
10	261	2	900/1800	10	3	117	11
11	931	4	15 min	7	2	74	10
12	62	3	900/900/900	14	3	88	8
13	312	3	900/900/900	13	3	99	10
14	234	3	900/900/1200	15	3	108	12
15	352	3	900/1200/1200	15	3	104	8
16	310	3	900/900/1200	12	3	81	11
17	290	3	600/900/1200	15	3	94	10
18	103	3	900/900/900	15	3	85	8
19	5500	4	3000	16	4	128	16
20	1280	3	300	12	3#	102	10
21	1446	3	300	12	3#	95	12
22	488	3	300	12	3#	90	8
23	675	3	300	12	3#	89	10
24	5393	3	300	12	3#	117	12
25	4634	3	300	12	3#	90	11
26	4836	5	300	12	3#	110	12
27	2018	5	300	12	3#	95	15
28	2826	5	300	12	3#	137	13
29	2440	5	300	12	3#	114	14
30	2543	5	300	12	3#	11	12
31	3290	5	300	12	3#	102	12
32	3200	4	1500	12	4	165	23
33	614	list	1500	12	2	162	18
34	450	list	2500	48	12	182	12

Project still in progress

The recorded priority species were: *Buteo swainsoni**, *Geranoaetus melanoleucus**, *Circus cinereus**, *Cairina moschata*, *Coscoroba coscoroba*, *Cygnus melancoryphus*, *Aramus guarauna*, *Cariama cristata*, *Coragyps atratus*, *Oreopholus ruficollis**, *Pluvialis dominica**, *Cinclodes fuscus*, *Limnocites rectirostris**, *Limnornis curvirostris*, *Lochmias nematura*, *Spartonoica maluroides*, *Amblyramphus holosericeus*, *Cacicus solitarius*, *Gnorimopsar chopi*, *Sturnella defilippii**, *Xanthopsar flavus**, *Anthus nattereri*, *Pyrrhura frontalis*, *Rhea Americana**, *Bartramia longicauda**, *Tryngites*

*subruficollis**, *Coryphospingus cucullatus*, *Donacospiza albifrons*, *Emberizoides herbicola*, *Emberizoides ypiranganus*, *Paroaria coronata*, *Sporophila collaris*, *Sporophila cinnamomea*, *Sporophila ruficollis**, *Volatina jacarina**, *Nothura maculosa*, *Rynchotus rufescens*, *Cistothorus platensis*, *Turdus leucomelas*, *Neoxolmis rufiventris**, *Polystictus pectoralis* and *Xolmis dominicanus**. The species marked with * (present in red list) are selected for discussion.

4 Discussion

R. americana, *O. ruficollis*, *P. dominica*, *T. subruficollis*, *B. longicauda* and *N. rufiventris* are dependent of natural grasslands with short grass, situation very common in the studied systems. All of them can use sown pastures partially when grass is short, but need natural grasslands for nesting, except *O. ruficollis*, *N. rufiventris* and *B. longicauda* that are non-nesting migrants.

X. dominicanus and *X. flavus* are species that feed on relative short grasslands and needs patches of tall tussock grasslands or *Eryngium* beds for refuge and nesting. Communities of caraguata (*Eryngium pandinifolium*), essential for *X. flavus* nesting, are common in humid zones and tolerant to grazing. Some tussock species (eg. *Paspalum quadrifarium*) are frequent where no overgrazing is recorded.

Sporophila spp. and *V. jacarina* depends on tall grassland (height of 0,8 to 1,5 m). These communities are very rare in grazing areas and occurs in isolated patches, wetlands zones or long-term fallows. As these species use relatively small patches and are nesting summer migrant, partial grazing exclusions in some areas should be promoted. Other measures, such as the reduction of grazing intensity, can contribute to improve the conditions for these species and the before mentioned.

S. defilipii - This species is endangered, and its population has declined. Its survival depends on the conservation of natural pastures. This situation is maintained in most of the productive systems, however their nesting needs, which is in colonies, imply sward heights of about 15 cm in wide and homogeneous areas. These characteristics are rare in conventional livestock systems, except in years with heavy rainfall, so special management should be carried out.

Prey species like *B. swainsoni*, *G. melanoleucus* and *C. cinereus*, depend on conservation of large natural grasslands areas. Then the habitat for these species transcends farm management and depends on larger scale actions.

5 Conclusions

Pastoral livestock production system in Uruguay, based on natural grasslands, are very rich ecosystem in term of bird species. Traditional management provides suitable habitat for several priority conservation species, both for feeding and for nesting or refuge. However, there are some species, mainly those that depends on tall grass, that need special management measures in specific areas in order to create refuge patches. Other actions, such as the reduction of grazing intensity, can contribute to improve the conditions for the most threatened species.

References

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