

Current status of bird pest species in agroecosystems of Buenos Aires province, central Argentina

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Abstract

We carried out the first assessment of abundance and distribution of bird pest species (eared dove *Zenaida auriculata*, monk parakeet *Myiopsitta monachus*, picazuro pigeon *Patagioenas picazuro* and spot-winged pigeon *P. maculosa*) in the pampas of Buenos Aires province, Argentina, and analyzed their association with the presence of crops and/or introduced exotic woodlots in the rural landscape. We surveyed 35 transects located along secondary roads. Bird pest abundance was significantly higher at those sites with presence of woodlots ($p < 0.0001$). Species-specific analyses revealed that abundance of both monk parakeet and picazuro pigeon was sensitive to the frequency of woodlots of tall and perennial tree species (*Eucalyptus* spp.; $p < 0.001$), whereas eared dove abundance increased significantly with the frequency of woodlots composed by short and perennial tree species (*Pinus* spp., *Casuarina* spp.; $p = 0.002$). Most bird pest species in the study area are more sensitive to the presence of woodlots rather than to the presence of croplands in the rural landscape. These results have practical implications, suggesting that an effective control of bird pest species in Buenos Aires province could be attained by managing exotic perennial tree species woodlots.

Keywords: Argentina, Buenos Aires, eared dove, habitat management, monk parakeet, Pampas

Introduction

Eared dove (*Z. auriculata*), monk parakeet (*M. monachus*) and pigeons (including picazuro and spot-winged pigeon, *P. picazuro* and *P. maculosa*, respectively) are among major bird pests of Argentina (Bruggers et al., 1998). Population increase of these species has been associated to a mosaic landscape where food patches (croplands) and breeding habitats (patches of woodland) are present in suitable proportions (Bucher and Ranvaud, 2006). Most of these studies have been carried out in the region of the Espinal, where agriculture expanded into areas previously covered by dry woodland (Murton et al., 1974), whereas studies in the grasslands of the Pampas region are lacking. Trees were originally absent in the Pampas, even though nowadays woodlands of both native and exotic species have been establishing as riparian vegetation or along roadsides, or by the introduction of exotic tree species around rural buildings and as shading woodlots for cattle (Ghersa et al., 2002). The introduction of trees in Buenos Aires province has been followed by the expansion of doves, parakeets and pigeons (Daguerre, 1936; Gibson, 1919). In addition, recent concern of farmer associations due to crop losses in Buenos Aires province, where rangelands have been increasingly replaced by crops (Baldi and Paruelo, 2008) has prompted a survey of abundance and distribution of these bird pest species.

Materials and methods

Bird surveys were conducted during summer 2006-2008 along 35 transects located on secondary roads of Buenos Aires province (Fig. 1). Each transect was 20 km long, with permanently marked survey points located every kilometer. Surveys were performed following the point-count method (Bibby et al., 2000). All pest birds seen or heard within a 200 m radius around each point during a 5 min period were identified. In addition, the presence/absence and the identity of crops and/or woodlots were recorded at each point. Thus, each transect was considered as a block and the combination of the presence/absence of crops and/or woodlots were considered as treatments, resulting in 4 treatments of a block design (Zar, 1996): 1) crop+woodlot; 2) crop; 3) woodlot; and 4) grassland (control). The abundance of bird pest species was used as the response variable (data were log transformed). In addition, linear regressions were performed between the abundance of birds and the relative frequency of woodlots along transects.

Results

There was a significant difference of total bird pest abundance among transects (i.e., blocks), revealing a higher abundance towards the East of Buenos Aires province (Figure 1a; $F=1.88$; $p=0.01$). Tukey's contrasts among treatments revealed that bird pest abundance was significantly higher at those sites with presence of woodlots (Figure 1b; $F=13.61$; $p<0.0001$). Species-specific analyses revealed that abundance of both parakeets and pigeons was sensitive to the frequency of woodlots of tall and perennial tree species (*Eucalyptus* spp.; $p<0.001$), whereas dove abundance increased significantly with the frequency of woodlots composed by short and perennial tree species (*Pinus* spp. and *Casuarina* spp.; $p=0.002$). In addition, eared dove was the only species whose abundance was significantly higher at those sites with the joint presence of crops and woodlots ($F=9.03$; $p<0.0001$).

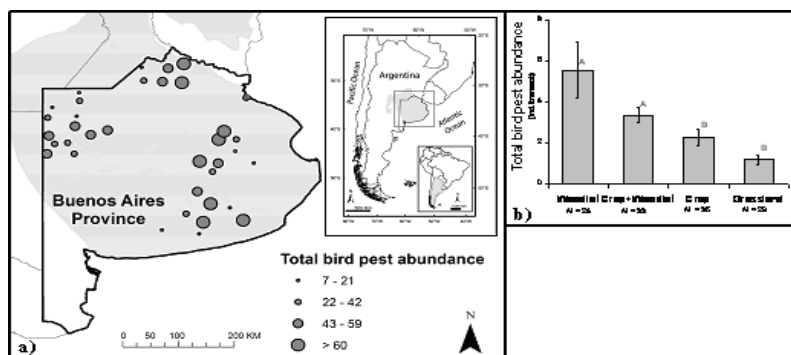


Fig. 1 (a) Study area (Buenos Aires province, Argentina, 307,571 km²), showing total bird pest species abundance sampled at each transect; (b) total bird pest species abundance according to the presence/absence of crops and/or woodlots in the rural landscape. Different letters show statistically significant differences (ANOVA and Tukey's test; $p<0.0001$ and $p<0.05$, respectively).

Discussion

To our best knowledge, this is the first comprehensive assessment of abundance and distribution of bird pest species in the Pampas of Buenos Aires province. Our results show that, overall, bird pest species in the study area are more sensitive to the presence of woodlots with exotic perennial tree species rather than to the presence of croplands in the rural landscape. The high affinity of parakeets with tall *Eucalyptus* trees should be related to the reduction of predation risk (and human control) on well-built nests located above a certain threshold height (Daguerre, 1936; Gibson, 1919). These results have practical implications, suggesting that an effective control of bird pest species in the study area could be attained by managing exotic perennial tree species woodlots, either by the reducing woodlots near to crops or by planting short and deciduous trees instead of tall and perennial trees.

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