Differential spatial use and spatial fidelity by breeders of Bonelli´s eagle

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INTRODUCTION

Bonelli's eagle (Aquila fasciata) populations have suffered an intense decline in Europe in recent years. The study by satellite telemetry locations of the breeding adults' movements in different periods of the annual cycle over the years could provide new information about home ranges and spatial fidelity. New conservation guidelines using this methodology can be implemented to improve breeding population and ensure populations viability.

Home range distribution and Kernels in the study area: Isopleths 5% (yellow) and isoplehts 50% (orange) were accounted as the nesting and core areas respectively. Isopleths 75% (brown) were calculated as the actively selected areas outside the breeding season for hunting or roosting and isopleths 95% (red) were defined as an estimate of the total home range.

METHODS

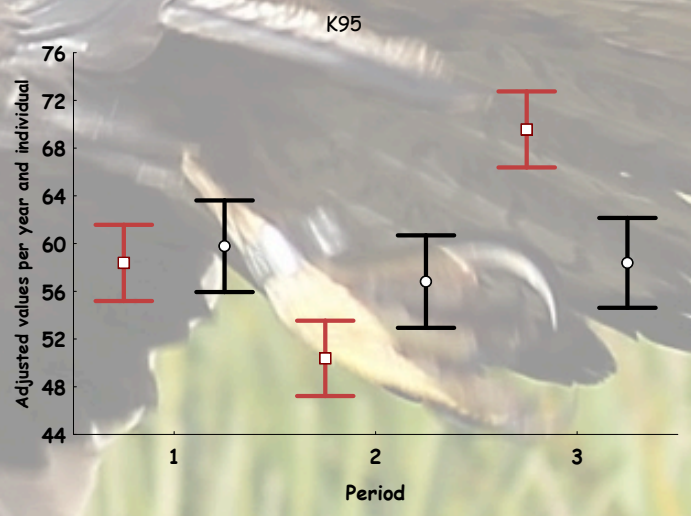
We studied 10 males and 7 females located in Aragon, NE Spain equipped with GPS PTTs and tracked over a total of seven years. Locations were used to calculate spatial parameters using Kernels Fixed Methods in GIS tools at different levels. Three periods over the annual cycle corresponding to non-breeding season (1), breeding season (2) and chicken's dependence (3) were established in order to assess differential home range behavior between individuals and sexes or differential spatial use over the year. The percentage of overlapping of home ranges and other parameters has been calculated to define the fidelity of individuals to the spatial situation of a particular territory. General linear mixed models (GLMM) were conducted to analyze such variations.

Degree of overlapping of home range during four years.

RESULTS AND DISCUSSION

In this population, there are individual variations in size and use of the home ranges ($P < 0,001$), due to resource availability and heterogeneity of each territory. Nevertheless, no interannual variations for the same individual were found, probably due to the increasing food foraging skills and diet heterogeneity.

Variations in home range and other spatial parameters over the year cicle were found ($P < 0,001$). Females showed smaller areas during breeding season since the presence of eggs or chicks in the nest restricts their activity.



Seasonal variability of home ranges (K95) of males (black) and females (red).

High fidelity rates to home ranges and core areas have been found in consecutive years (70 %) because of trophic plasticity or nesting substrate availability. However fidelity to nesting area was smaller (30%) as a result of differential use of available nests between seasons (failed reproduction, interspecific competition or reduce the presence of parasites ...)

Juan Carlos Albero

MANAGEMENT CONSERVATION

The maintenance of home range behavior between years and the individual home range fidelity guarantees that the adoption of any conservation measures will have an effect over time.

The corrective measure should not restrict to critical areas but they should be adjusted to the home range behavior and should be carried out throughout the year.

References

Pérez-García, J.M., Margalida, A., Alonso, I., Ferreiro, E., Gardiazabal. A., Botella, F., Sánchez Zapata, J.A. 2012.Interannual home range variation, territoriality and overlap in breeding Bonelli's Eagles (Aquila fasciata) tracked by GPS satellite telemetry. Journal of ornithology. (In press).

Ontiveros, D., Pleguezuelos, J.M., &Caro,J. 2005. Prey density, prey detectability and food habits: the case of Bonelli´s eagle and the conservation measures. Biological Conservation123, 19-25.

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GOBIERNO DE ARAGON