

PRELIMINARY ANALYSIS OF FOOD AVAILABILITY AND HABITAT USE BY THE WILD BOAR IN A MEDITERRANEAN AREA

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Abstract: Twenty adult wild boars were radiotracked for one year to determine habitat use in relation to food seasonal availability. Results showed that wild boars used more intensively the pinewood and the meadows, whilst maquis was used less than it would be according to its availability. Cluster analysis showed that the Wild boar's habitat use, measured by the number of active fixes, was correlated with the seasonal abundance of the main food resources.

Keywords: Wild boar, *Sus scrofa*, Suidae, Habitat selection, Food availability, Italy, Europe.

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1. Introduction

Several authors have emphasised the importance of different foods availability in determining the habitat use by the Wild boar (e.g. Aumaitre *et al.*, 1982; Mauget *et al.*, 1984), but a quantitative estimate of the main food items as well as their correlation with habitat selection has never been attempted. The aims of the present study were: 1) to assess seasonal variation in habitat selection by adult wild boars living in a Mediterranean coastal area; 2) to relate seasonal habitat use to food availability.

2. Methods

The study was carried out in the Maremma Natural Park, Central Italy (42° 39' N, 11° 05' E). The study area covers about 2,700 ha and is characterized by the following kinds of habitat: maquis, pinewood, olive-grove, meadows and dunes. Hunting within the study area is not allowed. Habitat use was studied by radiotracking in order to determine habitat selection by individuals. Twenty adult wild boars (> 4 years old) were equipped with transmitters and radiotracked from September 1992 to August 1993. A minimum of 20 fixes/animal month were taken. Habitat availability was determined by vegetation maps (scale 1:5,000). To test the hypothesis that wild boars use the different habitats according to their availability, chi-square test was adopted. When significant values for chi-square ($P < 0.05$) were found, the hypothesis was rejected and Bonferroni Confidence Intervals for the observed percent of use were calculated (Randall

Byers *et al.*, 1984). A one-year pilot study allowed us to determine the main food items used by the wild boars in our study area. The availability of these items (acorns, olives, grasses and cicadas) was estimated. The relative abundance of fruits was assessed by counting their number in cone-shaped collectors suspended under the trees each fortnight. The availability of cicada larvae (*Cicada orni*) was estimated by counting their numbers each fortnight in random plots 50 x 50 cm, 40 cm deep and by counting the number of exuviae along the trunk of pine trees. Both leaves and roots of grasses such as *Cynodon dactylon* and *Dactylis* sp. were eaten throughout the year in all habitats. These grasses are perennial and their relative abundance may be considered as a constant within each habitat and estimated only once in order to rank the different habitat types. This was done by randomly selecting 100 plots (20 x 20 cm) in each habitat. Cluster analysis was applied to Spearman Rank Correlation Coefficients (Zar, 1984) to test correlations among different factors influencing habitat use.

3. Results

Significant differences ($P < 0.01$) resulted in the use of the different habitat types in the four seasons. Results from chi-square and Bonferroni Confidence Intervals, based on active fixes only, showed that wild boars preferred the pinewood and the meadows during the whole year, while the maquis that covers about 50% of the study area, was used less than

expected according to its availability (Tab.1). The olive-grove was avoided in spring and summer but was used according to its availability in autumn and winter; the dune was always used less than its availability except in autumn. The pattern of monthly habitat use derived by the number of active fixes is shown in figure 1. Acorns and olives were available from October 1992 to January 1993; cicada larvae were available

from the end of April to the end of July and pine-seeds were available in summer. Grasses were more abundant in the meadows and absent in the dune. Cluster analysis (Fig. 2) showed that the Wild boar's habitat use measured by the number of active fixes, was correlated with the seasonal abundance of the main food resources.

Table 1: Percent availability (P exp.) and use (P obs.) of different habitats by individual radio-marked wild boars in 1992-1993. P < 0.01. Results from the Bonferroni Confidence Intervals are shown as follows: - = excluded; + = preferred; n.s.= used in proportion to availability.

HABITAT	AUTUMN		WINTER		SPRING		SUMMER		
	P exp.	P obs.							
MAQUIS	0.58	0.25	-	0.30	-	0.15	-	0.12	-
PINEWOOD	0.24	0.44	+	0.38	+	0.54	+	0.54	+
OLIVE-GROVE	0.11	0.09	n.s.	0.09	n.s.	0.05	-	0.03	-
MEADOWS	0.05	0.21	+	0.22	+	0.26	+	0.31	+
DUNE	0.02	0.01	n.s.	0.005	-	0.001	-	0	-

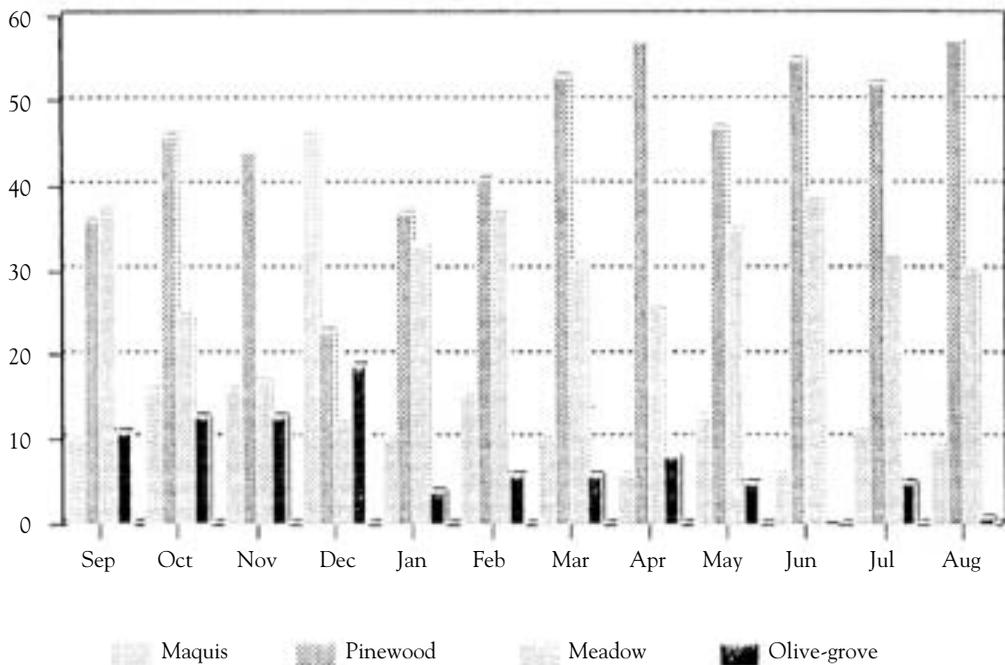


Figure 1 - Habitat use by the Wild boar as determined by the number of active fixes in different habitat types.

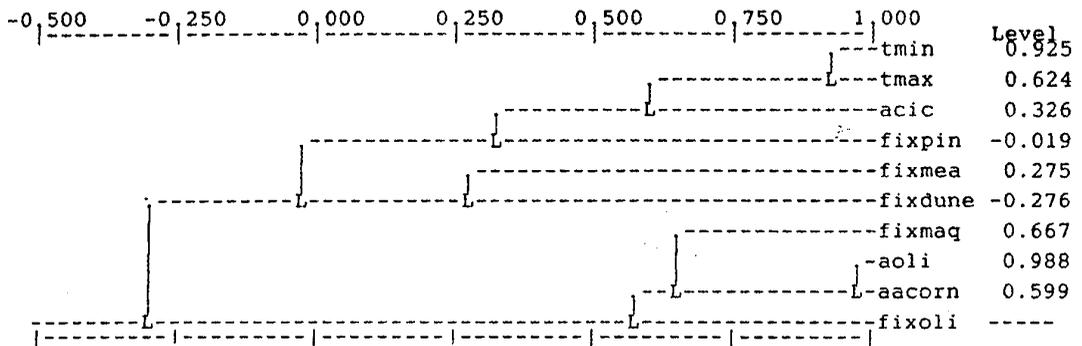


Figure 2 - Dendrogram resulting from the cluster analysis of the following variables: mean temperatures (tmin and tmax); number of active fixes (fix) recorded in each habitat; availability (a) of acorns (acorn), cicada larvae (cic), olives (oli). Clustering by minimum distance method.

4. Discussion and conclusion

A number of authors have assumed or suggested that habitat use by the Wild boar is correlated with food availability and that the searching for highly energetic food such as acorns may cause local migrations (e.g. Bromlej, 1964; Durov, 1987). During our study the general patterns of habitat use by the Wild boar showed little seasonal variation and a constant preference for the pinewood and the meadows. The Wild boar spends much of its active time feeding (Mauget, 1978), so that the number and proportion of active fixes in different habitats can be related with food availability. The relative abundance of olives and acorns which were concentrated over three to four months can explain the use of the olive grove in autumn-winter and the increased use of the maquis in the same period. The winter 1992-1993 acorn availability was very low in comparison to other years and the wild boars fed mostly on grasses (unpubl. data) during that time. That is why the preference for meadows justified the great number of active fixes recorded in this habitat. A close relationship was also found between the cicada larvae abundance and the pinewood use. In Maremma Natural Park, meadows and pinewood are in close association and this explains the constant preference by wild boars for both. We conclude that any study on habitat use should also take into account the availability of the main food resources for the species under study.

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