

THE WILD BOAR MANAGEMENT IN A PROVINCE OF THE CENTRAL ITALY

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Abstract: The province of Siena is inhabited by considerable Wild boar populations. The analysis of hunting data and agricultural damages in some different areas showed that damages were much more onerous in agricultural (vineyards especially) landscapes where, moreover, hunting is less intensively practised. It is evident that management actions have to be diversified in accordance with these differences.

Keywords: Wild boar, *Sus scrofa*, Suidae, Damages, Hunting.

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1. Introduction

A large Wild boar population of different origins occurs in the province of Siena, southern Tuscany. A local subspecies, *Sus scrofa majori* (De Beaux & Festa, 1927), was supposed to inhabit south-west Tuscany. Recent biometrical studies have questioned the validity of such a subspecies (Apollonio *et. al.*, 1988; Randi *et. al.*, 1989). Around 1950, the Wild boar was rare and only present in the south-west of Siena province (Maremma). In Tuscany, as elsewhere in Europe, the "wood-based economy" crisis, broken out between the '50s and '70s, allowed the demographic increase of the Wild boar (Saez-Royuela & Telleria, 1988). This development was accentuated by introductions of central-european Wild boar for hunting purposes (Erkinaro *et. al.*, 1982). Introductions were also made in the east of the province (Chianti and Chiana Valley). Presently, a western area where there are hybridized populations, a north-eastern area (Chianti) and a south-eastern area (Chiana Valley) where there are introduced populations only can be identified.

In Maremma, Wild boar hunting is an ancient tradition. It is practised by hunting teams using hound packs. The Wild boar population increase promoted an increase of hunting teams number. Only three teams were hunting in 1945, but in 1989 there were no fewer than 154 (about 5,000 hunters for each hunting day, Mazzoni della Stella, 1986). On average, more than 4,000 wild boars are killed every year in the province of Siena, over an area of 362,000 hectares.

Every year the Province of Siena Administration has to pay on average of 313,000 US \$ for Wild boar agricultural damage. Since 1987 Wild boar hunting and management have been regulated following the guideline provided by the National Wildlife Institute (I.N.F.S.), (Spagnesi & Toso, 1991). The provincial territory has been divided in two areas: one where the Wild boar presence is compatible with local land management, and one where Wild boar presence encroaches human activities and has to be consequently limited. In 1988, in Monticiano territory, in the centre of the oldest Wild boar area, an "A.R.S." (Area a Regolamento Specifico, *i.e.* especially managed area) for advanced Wild boar management was established.

2. Methods

From the 1990-91 hunting season the Province of Siena Administration has aged wild boars shot by hunting teams to improve the knowledge of the local population structure. The Monticiano A.R.S. was selected as a testing area, and Merse Valley (south-west) and Chianti as control areas. The number of participating hunters and that of wild boars shot, as well as sex and weight of the latter were taken from hunting registers.

Age was determined by tooth eruption (Boitani & Mattei, 1991). Four age classes were established: the 1st class included 0 to 12 months old piglets; the 2nd class comprised 13 to 24 months old wild boars, the 3rd class included 25 to 36 months old wild boars and the 4th class included adults more than 36

months old. Hunted population densities have been expressed as killed Wild boar number per 100 hectares of hunting area. Agricultural damage has been estimated as indemnities paid by the Province of Siena Administration to farmers, expressed as a cost per hectare of agricultural and forest area and per killed Wild boar. Correlations were evaluated by the Spearman rank correlation coefficient (rs) (Fowler & Cohen, 1993). Differences between population structures were tested through a contingency analysis (Daniel, 1978).

3. Results and discussion

The age of 2,870 killed wild boars was determined: from 1990 to 1993 in Monticiano area (n = 1,669), for the hunting season 1991-1992 in Merse Valley (n = 612) and in 1992-1993 hunting season in Chianti area (n = 589). The sex ratio in Monticiano was 1:0.8, whereas in Merse Valley it was 1:0.88 and in Chianti it was 1:1.03. The Monticiano population structure was not significantly different from that in Merse Valley (chi-square=7.25, df=3, not significant). However the female piglet age class differed in these populations (chi-square=5.16, df=1, p<0.05). The Monticiano population was significantly different from the Chianti population structure overall (chi-square=46.47, df=3, p<0.01), for the female piglet class (chi-square=13.64, df=1, p<0.01), for the adult female class (chi-square=22.21, df=1, p<0.01) and for the adult male class (chi-square=5.61, df=1, p<0.05). In Chianti the high proportion of female piglets (≤ 12 months old) may have been caused by clandestine releasing

for hunting purposes: young females are sold for lower prices than young males and can be transported easily. The abnormally low proportion of adult males and females in Chianti is consistent with the recent artificial origin of this population (Tab.1).

Average damage differed between the various areas. In the western area, in the last three years, 1.1 US \$ per hectare have been paid. At the same time, in Chianti 2.0 US \$ per hectare, and in Chiana Valley 2.9 US \$ per hectare have been paid. Similarly, in the western area the mean indemnity paid for each Wild boar killed was 28.0 US \$, while in Chianti and in Chiana Valley was 83.0 US \$ and 146.4 US \$ respectively (Tab. 2). These data can be interpreted by looking at the ecological characteristics of each area. The western area has a large proportion of wood, a small proportion of herbaceous cultivations and grazing lands and, especially, a modest proportion of vineyards. On the contrary, in Chiana Valley, the agriculture is managed by industrial methods and it is based on cultivations of high economic value. In Chianti the wood percentage is the greatest, but there is the largest proportion of vineyards too (Tab. 2). The Wild boar is not causing considerable damage in the western area, while in Chianti and Chiana Valley it is in strong conflict with local agriculture (Meriggi & Sacchi, 1991). In particular, the indemnities extent has shown a direct, significant association with the local vineyard extension (rs=0.508, n=22, p<0.01). Environmental characteristics have a strategic importance (Casanova & Massei, 1986; Lescourret &

Table 1 - Age class and sex distribution (%) of wild boars shot in different study areas and years.

	Total number	female piglets	male piglets	female yearlings	male yearlings	female subadults	male subadults	female adults	male adults
Monticiano 1990/91	487	18%	19%	10%	20%	7%	9%	9%	8%
Monticiano 1991/92	413	10%	15%	18%	24%	10%	15%	4%	4%
Monticiano 1992/93	769	17%	23%	12%	17%	8%	9%	9%	5%
Merse Valley 1991/92	612	17%	16%	15%	22%	9%	13%	5%	3%
Chianti 1992/93	589	28%	24%	14%	17%	6%	6%	3%	2%

Table 2: Indemnities paid, land use and hunting parameters of the study areas in Siena province.

	Western area	Chianti	Chiana Valley
Indemnity US \$/ha	1.1	2.0	2.9
Indemnity US \$/killed Wild boar	28.0	83.0	146.4
Wood (%)	52.0	54.5	22.8
Vineyard (%)	4.7	13.9	5.7
Herbaceous cultivations and grazing land	41.9	29.0	62.9
Killed wild boars/100 ha	3.8	2.4	2.0
Foraging sites/hunting team	1.5	1.3	1.0

Genard, 1985). If the number of killed Wild boar per 100 ha is compared with damage refunding we can observe that higher damage is associated with lower numbers. In the last three years, on average, the greatest number of killed wild boars per 100 ha (3.8) has been actually observed in the western area, while lower numbers have been recorded in Chianti and Chiana Valley (2.4 and 2.0 respectively) (Tab. 2). Wild boar hunting in the western area is an ancient tradition and a sound organisation. The hunting teams have many members and many of them are engaged in Wild boar management. Each team of the western area hunts on average for 30 days, in one season, with an average participation of 36 hunters. The same hunters supply the Wild boar with large quantities of maize at the "right" season (summer) and in the "right" place (inside the wood, far from farmed fields). In Monticiano, where artificial feeding is carried out during the whole year, the damage prevention gets very good results: in the last three years, the mean indemnity per hectare has been just 0.2 US \$, vs. an average indemnity of 1.1 US \$ in the western area (Andrzejewski & Jezierski, 1978; Vassant & Breton, 1986; Vassant *et al.*, 1987). In Chianti and Chiana Valley the situation is different: teams have a smaller number of members, a lower hunting day number, an insufficient interest in the territory management and allow the wild boars to eat freely at public expense (Tab. 2).

4. Conclusions

The Province of Siena Administration is taking steps towards a better Wild boar management, but it has still got a good deal to do. First of all it is necessary to diversify the management in the three areas. It is absurd to "persecute" the Wild boar everywhere, but it is as much absurd to bear it everywhere. It is first

necessary, to oppose, always with the greatest severity, clandestine releasings (Lovari, 1991; Massei & Toso, 1993). Hunting areas need to be limited especially where wood and vineyard are contiguous. Culling should be increased everywhere, particularly in agricultural areas, to obtain a general density reduction. It may even be locally advisable to carry out control operations in protected areas. In this connection it is also important to evaluate carefully the establishment of protected areas. Artificial feeding must be regulated and addressed to the protection of agricultural areas only.

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Study area: Tuscany, Central Italy.