

**ABSTRACTS AND CONCLUSIONS  
FROM THE THIRD WORKSHOP  
OF THE EUROPEAN WILD BOAR RESEARCH GROUP  
ZARAGOZA (SPAIN), 4-5 DECEMBER 1998**

ORGANIZED BY THE INSTITUTO PIRENAICO DE ECOLOGÍA (C.S.I.C.)  
& EGA, WILDLIFE CONSULTANTS, S. L.

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**Aims and conclusions**

Wild boar is nowadays the most abundant and also the most hunted wild ungulate in Europe. Their numbers have increased dramatically in the last twenty or thirty years as a result of rural depopulation and land use changes. Their high fertility and generalist feeding habits have also favoured their expansion. The main concerns of the current situation of the wild boar centre on: a) damage to agriculture (in some countries wild boar has been declared as pest); b) population regulation and management through hunting; c) survey of the effects its abundance has on terrestrial ecosystems.

As part of the series of Workshop that the European Wild Boar Group are holding in the nineties (the first in Toulouse 1991, the second in Turin 1993), we held the third Group Workshop in December 1998 in Zaragoza (Spain). The aim was to meet specialist working on wild boar and discuss management problems, methodologies and recent research results concerning the species. The proposed topics for discussion were:

- Monitoring wild boar populations in mountain environments
- Management problems
- Rooting effect in mountain environments

- Use of GPS, GIS and traditional radio-telemetry
- Health implications.

Twenty four researchers and wildlife managers from 7 different countries took part. In the following pages we include the corresponding abstracts.

The main conclusions of the meeting were as follows:

1. Wild boar are linked to human activities, to the way humans use the landscape and its resources. This determines the possibility of wild boar existing and causing conflicts. As an opportunistic species, wild boar are able to live in almost any European landscape, from high mountains, forests and riverine habitats to highly intensified agricultural areas, always depending on human acceptance
2. Conflicts between interests affected by wild boar (crop damage, livestock damage, hunting resource, disease carrier, car accidents, predation on wildlife, etc.) need integrated approaches involving all social sectors having some interest in the species, e.g. hunters, farmers, managers, etc. Hunters, in particular, should be aware of the importance of wild boar in ecosystems and should be involved in its management. In many cases, problems with wild boar are rooted in human perception and have to be solved by considering the human dimension
3. Long-term research using boar marked with eartags and radiocollars is the most important methodology to be applied to this species. This kind of method should be applied in different ecological situations in Europe and the results used as a support for better population management
4. Recapture of marked boar has revealed their large dispersal movements in several European landscapes, thus highlighting the importance of crossborder research, particularly in mountain environments
5. Traditional hunting methods can be an important cause of mortality in some populations. In others, they have proved not to be an effective way to regulate boar numbers, food availability being the main regulator
6. Forests, particularly deciduous ones, are the best areas for wild boar. Wild boars are important primary consumers, scavengers and predators of numerous invertebrates that are potentially harmful to forest management, and their rooting activity plays an important role in forest regeneration. These factors should be taken into account in relation to forest regeneration, crop damage and wild boar carrying capacity

7. There are very different hunting regulations for wild boar throughout Europe. The species is considered an important natural resource, particularly for recreational hunting, and at the same time a pest requiring effective control
8. Protected natural areas are important for wild boar, as there they are normally more protected from hunting activities and are able to find food and shelter. At the same time, these areas produce and export wild boar to the surroundings, thereby becoming a source of conflict with landowners, and thus having a negative effect on the protected area
9. Wild boar rooting activity affects biodiversity. The way this impact affects natural succession, invertebrate and fungi communities, forest regeneration and pasture composition should be one of the main objectives of future wild boar research
10. Artificial food supplementation in many European populations is considered a problem. The dynamics of such populations is severely affected by the amount of food provided, allowing high densities and an extended parturition period that lasts for most of the year. Nevertheless, in certain stable populations (i. e. central France) specific provision of grain could be a useful tool to prevent damage.

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## ABSTRACTS

### WILD BOAR STATUS IN URUGUAY

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Wild boar (*Sus scrofa*) were introduced into Uruguay at the end of the nineteen twenties. Due to the favorable environmental conditions, such as a wide riverine web, availability of refuge areas and a wide variety of available food, the population greatly increased. At the same time, boar hybridized with domestic pigs producing offspring that were larger than normal wild boar and at the same time rough-looking.

This increase affected different production levels, particularly sheep. The Uruguayan Wool Secretariat (SUL) carried out a national inquiry among farmers in 1996 to obtain objective data on the conflict. The results indicate that damages mainly affect sheep (70%) and crops (24%). Damages to sheep are estimated taking into consideration direct loss due to predation and the reduction in the number of animals.

The first management decision was to authorize free hunting of the species. Controls are undertaken by groups of 4 to 7 hunters with 6 to 20 dogs. Different types of guns are used as well as long knives to kill the animals.

In January 1998, a Food and Agriculture (FAO) project on this problem was approved. Its main objective was to draw up a damage control strategy. The project considers the need to create a multidisciplinary coordination group, a methodology for financial assessment of damages, and the drafting of projects concerning biological research and population management in selected areas.

## ONGOING PROJECTS ON WILD BOAR IN PIEMONTE

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The Wild boar is reappeared in Piemonte region around 1920, probably coming from southern France and following restocking carried out by hunters. Today, the high wild boar population density is a relevant problem with ecological and economic - environmental relevance. The main projects carried out on wild boar in Piemonte focus on population estimates on hunting data, impact on agriculture and space use by radiotracking.

The alpine area of Torino province is a particularly interesting environmental situation because represents a wild boar's recently colonised area. The efficiency of this recolonization is supported by wild boar ecological plasticity, by the change in human land utilisation with progressive abandonment by rural population traditionally living in this area, which caused high food availability for wild boar, especially chestnut (*Castanea sativa*) and progressive elevation of winter temperatures. Moreover, it is very important to underline the genetic pollution caused by eastern European wild boars, reintroduced for hunting purposes and more adaptable to rigid climatic conditions than the original North Italian population.

The economical impact of the wild boar have led the local administration of Torino Province to develop a management plan. For example, in 1992 the Province refund farmers for crop damages caused by game for about 175000 EU. The principal crops damaged were grassland (63 %) and maize fields (15 %).

In Piemonte wild boar hunting is a relatively recent practice. In the last few decades the number of hunted wild boars remarkably increased. During 1996 and 1997 quantitative data on wild boars population were obtained using wild boar driving censuses in the alpine area of Torino province (376000 hectares). In 1996 there were around 1800 wild boars killed and in 1997 around 1900. The wild boar population structure in 1996 and 1997 obtained by hunting data differs from a pyramid-shaped theoretical distribution of age classes. This difference is mainly due to scarce presence of piglets (< 6 month). This problem, relevant for correct population estimate, is probably due to low hunter interest on piglets or their minor catchability, this fact is in contrast also with monthly birth distribution that shows birth concentrated in late spring, but present all around the year.

The hunting of wild boar is an important control strategy in relation to the entity of agricultural damages. A quantification of the catch effort and the determination of the environmental situation that could increase wild boar damages should be an important task.

## SITUATION OF THE WILD BOAR IN CENTRAL PORTUGAL: A PRELIMINARY APPROACH

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The current distribution, status and evolution of the wild boar (*Sus scrofa* L.) hunting population over the last six years in central Portugal are reported. The data are based on wild boar hunting bags (drive hunting and night hunting by waiting) provided by municipalities in the study area. The initial data obtained from hunting activity (from 1991/1992 to 1996/1997) highlighted a significant increase in captured animals between the Douro and Tejo rivers, both in terms of distribution area and total number of captured animals. The highest increase is seen in the areas near the border with Spain. As regards wild boar distribution in central Portugal, we can define two core areas with the highest densities and a relatively well-structured population: the south-east part and the central part. In the other zones of the study area, wild boar abundance is lower, indicating an unstable population resulting from boar dispersing from the main core populations. A preliminary approach to identify habitat variables, with significant differences among the six classes considered for wild boar distribution, was conducted using the Kruskal-Wallis test. This distribution is more related to aspects associated with forest structure and human presence than to agricultural crop type.

## BASIS FOR A STUDY PROJECT ON THE EFFECT OF WILD BOAR ROOTING ON MEADOWS AND PASTURE COMMUNITIES

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An increase in the wild boar population in the Pyrenees causes a rise in the number and surface area of rooting areas in mountain pastures. In field crops and sown meadows, this activity is considered as damage and a productivity depressor. Nevertheless, in extensive pastures (summer supraforestal pastures with low stocking rate) and in protected areas, emphasis should be put on assessment of the ecological changes that rooting causes.

At least three research studies could be undertaken concerning this problem:

- a) Effects of rooting activity on pasture communities.
- b) Feeding habits and use of space by wild boar.
- c) Problems related with damage assessment and species management.

We discuss the objectives that each of these research topics should deal with and the methodologies that could be used.

## DEMOGRAPHY OF A MOUNTAIN WILD BOAR POPULATION IN THE SOUTHWESTERN PYRENEES

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We studied the demographic characteristics of a hunted wild boar (*Sus scrofa*) population living in a mountain environment without supplementary

feeding in the south-western Pyrenees. A total of 294 wild boar were collected from October to February during the 1990-91, 1991-92 and 1992-93 hunting seasons. The average *corpora lutea* were 4.4 (SE=0.2) per pregnant sow, and the number of fetuses 3.3 (SE=0.1). Neither changed according to hunting season, age or female weight. Exceptionally, females became pregnant in their first year (one case out of 95), normally doing so in their second year aged approximately 20 months. The sex-ratio did not differ from a 1:1 proportion in adults or at fetal age although there was a slight predominance of females at fetal age and a significant difference for females older than 36 months ( $\chi^2=9.6$ ;  $df=1$ ;  $P=0.009$ ). 56% of hunted animals were younger than 24 months, as in most study populations. Male survival rate was worse than the female rate (Logrank:  $\chi^2=15.11$ ;  $g.l.=1$ ;  $p=.0001$ ). Population longevity was almost 11 years, the maximum described for wild boar. Lack of a clear population trend between 1974 and 1992, together with great oscillations in abundance, low fertility and high longevity indicate that the population has been at the territory's carrying capacity since at least the start of the 1970s, that hunting does not seem to be an important cause of mortality and that food availability must be the real population regulator.

## DISPERSAL PATTERNS IN THE WILD BOAR

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The proposed study will describe the dispersal patterns of recently escaped or released wild boar in Sweden. Typically, we will estimate dispersal rate and identify differences between sex and age. Habitat structure and seasonal changes in suitability will also be recorded.

Free-ranging wild boar appeared in Sweden in 1975. In the study area, the first observation of a wild boar occurred in 1984. Marking with eartags commenced in 1989, and the results are based on 246 animals reported dead (144 males and 102 females). The dispersal process in Sweden can be considered to be slow. The most likely reason is the high mortality rate. Only about 20% of a cohort reaches two years old. 90-95% of mortality is



due to hunting. Mean recapture distance is 6.7 km overall, with a significant difference between males and females. Mean recapture distance for females is 3.2 km, while for males it is 9.2 km. Farrowing occurs at any time of the year although there is a peak in February to May. No effect of birth date on recapture distance was detected. Age, however, has an effect on the timing of dispersal. Mean age for dispersal is 12 - 15 months, both for females and males. The mean distance where dispersal rate levels off is, however, different between the sexes. The fitted function levels off at a mean distance of 4.5 km for females and 17.8 km for males. The pattern of observed dispersal suggests a meta-population system, in which habitat structure is important as is the amount of supplementary feeding by hunters.

## SOCIAL PROBLEMS OF WILD BOAR MANAGEMENT IN MOUNTAIN AREAS

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The Navarre region has a social hunting system characterized in mountain areas by the adjudication of hunting areas to local hunting clubs, which have no structural organization and do not admit foreign hunters. This means that clubs are unable to respond to their obligations as hunt managers. Conflict worsens with wild boar damage to crops, which is approximately 4 million ESP in the study area.

The Regional Government of Navarre undertook an experiment in technical and socio-economic management in two Pyrenean hunting areas. The objectives were: i) to provide solutions to the conflict between farmers and hunters; ii) to demonstrate the effectiveness of some techniques in protecting crops, and iii) to try to develop a viable new management model for the future. A convention was established between all the stakeholders (Government, municipalities, hunters and farmers), involving a monitoring

commission and the development of technical management, organization and a routine survey of the experiment. The experiment has proved satisfactory. Damages have been prevented almost completely. Local hunters can hunt in their areas and foreign hunters can hunt with them, thereby increasing incomes derived from the tourist sector so a viable economic model can be developed. However, it is unlikely that this model will be maintained by local stakeholders because of their scarce involvement in assuming responsibilities and the lack of experience in communal activities.

## ESTIMATING WILD BOAR NUMBERS BY COUNTING FAMILY GROUPS

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In 1994 and 1995, the presence of wild boar family groups (females with piglets) was surveyed in Somiedo Natural Park (Asturias, northern Spain). Systematic records were taken by sightings, automatic cameras, and track counts. All the records for family groups were mapped to singularize them using a GIS model of spatial split based on mean propinquity. Doubts about close identifications were dispelled by comparing simultaneous sightings. This method allowed us to discriminate and quantify a minimum number of family groups. On this basis, population size could be estimated by means of the proportion of sighted animals in family and non-family groups. We obtained wild boar densities for 1994 and 1995 ( $1,131 \pm 0,346$  and  $1,217 \pm 0,675$  wild boars/km<sup>2</sup>). In comparisons of annual multiplication rate based on family groups (1,076) with the rate obtained with wild boar hunted in the park (1,086), both proportions were quite similar. While population size did not change in either year, population structure did change, the number of family groups nearly doubling from 11 to 19.

## **WILD BOAR DAMAGE SELECTION IN THE CANTABRIAN MOUNTAINS, SPAIN**

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The increase in the wild boar population in Asturias (northern Spain) in the 1980s has caused a management problem due to increased damages. Damage compensation in 1993 was almost 73 million pesetas, i.e. almost 700,000 pesetas (over 4000 ECUs) per 100 km<sup>2</sup>. Nowadays, wild boar is the main problem species among Cantabrian fauna, its compensation values being 140% of wolf damage. Most damage affects grasslands (63%) and cornfields (31%), as other crops cover small surfaces. This is somewhat different to the situation in other European countries, where mainly cereal crops are affected. The high proportion of damage to grasslands in Asturias is due to the large surface area of pastures throughout the Cantabrian Mountains. Comparing damage frequency with the availability of all kinds of fields, wild boar present negative or neutral selectivity for grasslands, and clear and strong positive selectivity for cornfields. Avoidance of grasslands could explain why damage to pastures decrease markedly after October, when nuts (acorns and chestnuts) have fallen, providing wild boars with a very desirable and abundant resource.

## MONITORING A WILD BOAR POPULATION IN ZONA VOLCÀNICA DE LA GARROTXA NATURAL PARK

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The monitoring of the wild boar population in Zona Volcànica de la Garrotxa Natural (Regional) Park in Catalonia (NE Spain) began in the 1990/91 hunting season and has continued to the present. This program is promoted by the park administration and is an experiment in co-operation between wildlife managers and hunters. In the natural park, wild boar hunting takes place in Private Hunting Areas and the applied method is the traditional beat with the help of trained dogs. Hunters actively search for wild boar tracks prior to each beat in order to detect their most likely location.

At present, 8 hunting teams are contributing data from a 30,000 Ha area. In each beat, number of captures, number of hunters and characteristics of killed wild boar (sex and weight) are recorded. In 1996, reproductive parameters were also included in the monitoring. The collection of uteruses, examination of ovaries and fetuses made it possible to obtain rates of pregnant females and the number of fetuses per female. Furthermore, acorn production has also recently been included in monitoring. Population trends are estimated by means of a density index that takes into account the number of captures in relation to both hunting area and hunting effort. Annual variation in hunting pressure, captures in relation to hunting area and density index based on captures by area and effort unit are analyzed and the effects of hunting pressure and acorn production are considered.

## A NUMERICAL INDEX FOR SPATIAL DISTRIBUTION AND PREFERENCE: SNOWY BIRDS, BLACK BEASTS AND ADDITIONAL OBSERVATIONS

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A numerical index for spatio-temporal distribution and preference was developed at the Tour du Valat Research Station in the Camargue (France) during a research project on the little egret (*Egretta garzetta*) in 1984. It remains within discrete boundaries and expresses presence as «densities» per unit, each being compared intrinsically with overall presence on the observation entity.

The index was used again in 1986 to analyze the distribution of signs of wild boar (*Sus scrofa scrofa*) presence on a vertical observation line of 16 scent posts on a mountain slope in the western Pyrenees (France). From June to October 1986, signs of boar presence were monitored. One lower and one higher subseries were distinguished. The higher part of the slope appeared to be preferred throughout the observation period. The higher reaches are forested and the lower have open vegetation. Boar seemed to seek the cooler forest environment in hot summer weather. As refuge cover is abundant everywhere, this would seem to be a key factor. The sharp drop in boar presence in October is probably due to disturbance by hunters and mushroom cullers. Later observation showed boar to have ascended vertically and used several posts subsequently. The posts were quite likely too close to each other, and the overall scale of the set-up too small. However, this method may be useful when used over an entire mountain slope with considerable vertical spacing between posts.

Boar were not the only animals detected at the scent posts; there were signs of domestic cattle (*Bos taurus*), badgers (*Meles meles*) and brown bears (*Ursus arctos*). It is interesting to note badger, boar and bear cohabiting and their roles as scavengers.

## MANAGEMENT OF WILD BOAR POPULATIONS IN MOUNTAIN ENVIRONMENTS USING MANAGEMENT UNITS

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The number of wild boar shot over the last ten years has considerably increased in mountain *départements* as in the rest of France, with 91 000 and 322 000 being shot in 1987 and 1997, respectively. Management regulations are determined at *département* level by the hunting organizations and the hunting administration. Before the 1970s, people wanted to eradicate wild boar. After the 1970s, wild boar damage has all been paid for by hunters under the aegis of the ONC. This has led to a change in attitudes. After being considered a pest at first, wild boars became a game species. Populations appeared everywhere, especially in mountain areas. Wild boar colonized slowly at first and then quickly because of hunter inexperience and big reserve areas.

We are now trying to promote wild boar management units over different municipalities from 100 to 300 km<sup>2</sup>. A density aim based on the number of wild boar shot for a long-term period is fixed. The wild boar census is carried out by monitoring the wild boar shot in terms of weight, sex, age of shot animal and speed of hunting success. Different effective rules can be made to prevent crop damage and to control wild boar populations. Reserve areas may be changed, hunting periods may be extended, and wild boar may be hunted starting between August 15 and September 15 until February.

In rural areas with low human density, hunters are too old and too few to regulate wild boar populations, which increase rapidly. The number of wild boar shot by a team of hunters with fast-driving dogs reach a maximum quickly and it is not proportional to density. It is difficult to increase the number of hunting teams to increase the number of boar shot. Wild boar colonized mountain areas very recently and time is needed to find a new balance.

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