WILD BOAR POPULATION DYNAMICS AND MANAGEMENT IN HUNGARY

Csányi S.

Wildlife Biology Station, University of Agricultural Sciences, H-2103 Gödöllõ, Hungary.

Abstract: In this contribution population and harvest data as well as a simple harvest model are presented. The results show that the population growth was supported by the following elements: the harvest rate of Wild boar populations was always much lower than it is necessary to achieve a zero growth rate, *i.e.* to stabilize the population; hunting pressure on larger populations is inefficient, these populations are underharvested and surplus individuals can immigrate into the surrounding areas; during the last decades the afforested area of the country increased and this gave considerable additional habitat for Wild boar; the large-scale agriculture provided excellent habitat (large field size) and foraging opportunities for Wild boar. On the basis of the results the elements of an effective Wild boar management are also described.

Keywords: Wild boar, *Sus scrofa,* Suidae, Population dynamics, Management, Hunting, Harvest model.

IBEX J.M.E. 3:222-225

1. Introduction

Wild boar (*Sus scrofa*) is an important big game in Hungary. In spite of the continuously increasing harvest, the Wild boar population has been increasing during the last 30 years (Fig. 1). Although this population growth resulted in much more shooting opportunities for hunters, damages of Wild boar caused in agricultural crops and forest plantations are considered as intolerable. According to the official guidelines of the 70s' and 80s', the supportable population ranged from 8,000 to 16,000 indivi-

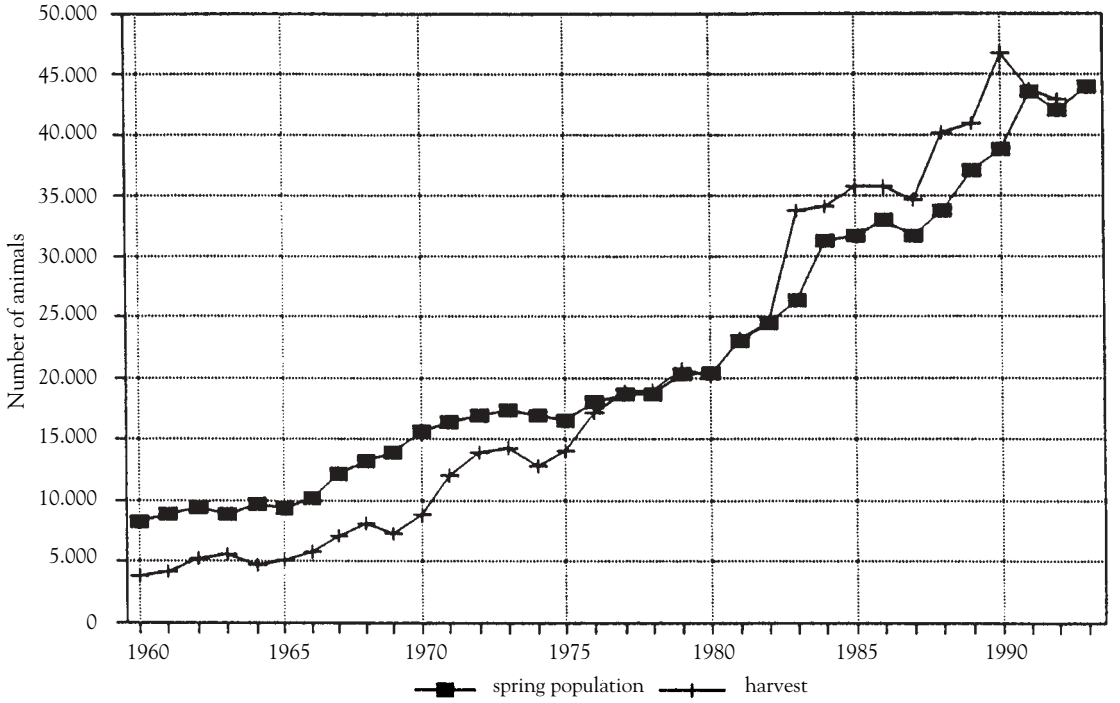

Figure 1 - Wild boar population dynamics (Reported spring population and harvest).

duals (Kõhalmy *et al.*, 1987). To achieve this goal hunting methods of Wild boar are very liberally determined (*e.g.*, night hunting with spotlights is allowed), and Wild boar can be shot all year.
This paper presents population and harvest data, and with a simple model under-harvest as a source of continuous population increase is evaluated.

2. Material and methods

Game management data (1969-1992) published by the Ministry of Agriculture were used for the analyses. These data include the reported spring population size and the number of wild boars shot during the same calendar year. The data are divided into management sectors: game management units managed by state enterprises [18% of Hungary: state forestries, state farms, military areas, etc.] and by hunting associations [82% of Hungary: ca. 700 units]. This allowed the separated analysis and comparison of hunting efficiency of the two groups.
The hunting efficiency was measured with harvest rates for each year (Harvest rate = harvest / spring population). The harvest rates were calculated for the two management sectors and from the country totals.
With a simple harvest model it is possible to calculate the harvest rate to stabilize the population size (zero population growth):

$$HR = \frac{P + P \cdot Fr \cdot R - P \cdot m - P}{P} = Fr \cdot R - m$$

where: HR = harvest rate, P = spring population, Fr = Proportion of reproducing females, R = number of piglets per female (reared until autumn), m = mortality rate.
Assuming 1:1 sex-ratio among the adults, 2.5-3.5 reared piglets/reproducing female and 5% natural mortality of the adults, the model suggests 1.1-1.6 harvest rate (110-160%) to keep the population size unchanged. This range is in accordance with the 100-150% harvest ratio given by other authors (Kõhalmy *et al, op. cit.*; Páll, 1982).

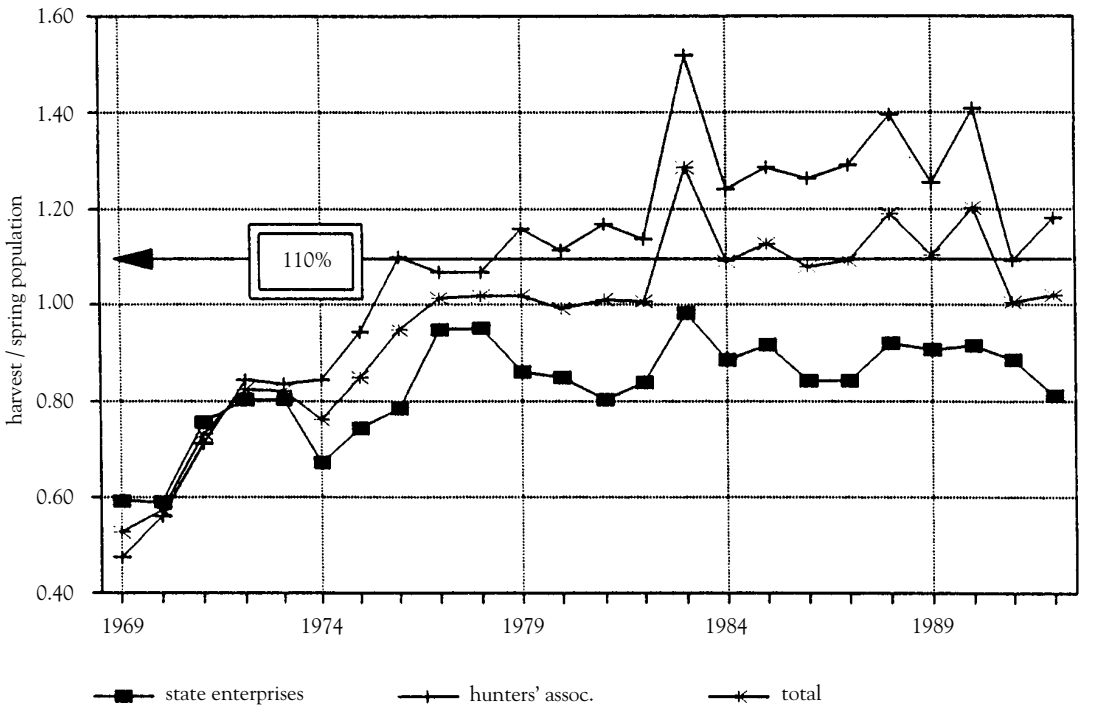

Figure 2 - Harvest rates of Wild boar in Hungary (1969-1992).

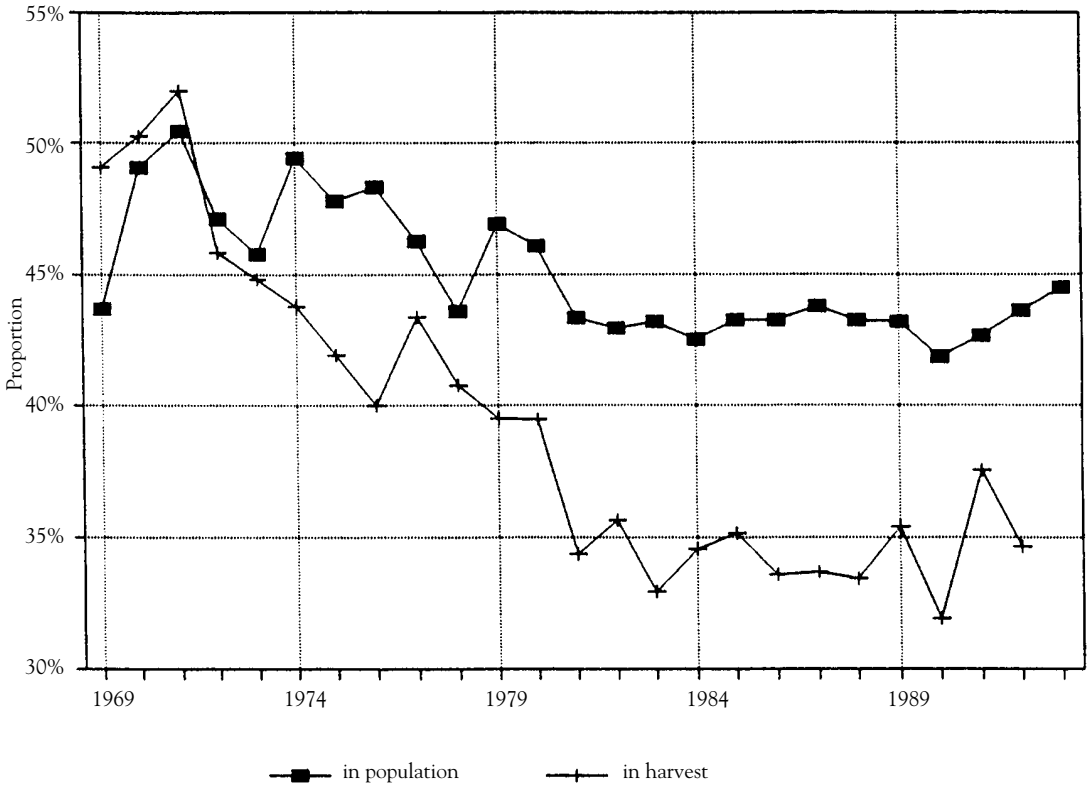

Figure 3 - Share of state enterprises.

3. Results

From 1969 to 1984 the harvest rate of Wild boar was increasing and since 1985 it is nearly stable. Since then, the harvest rate of Wild boar calculated from the country totals has reached the lowest value indicated by the model. On the other hand, there is a very great difference between the values of state enterprises and hunters' associations. In the areas managed by state enterprises the harvest rate was always much lower ($0.8 < HR < 1.0$), while in the other sector it ranged between 1.2 and 1.5 (Fig. 2).

This difference in hunting efficiency is very important if we consider that in the 70s' more than 50% and in the 80s' 40-45% of the spring population was reported in the area of state enterprises (Fig. 3). In the same time the share of state enterprise in the harvest declined from 50% under 35%. The disparity in the shares of state enterprises means that about half of the Wild boar population was under-harvested in the period investigated. This part of the Wild boar population could give a steady basis for continuous increase.

The effect of disproportionate harvest rates can be amplified by the geographical distribution of hunting areas managed by state enterprises (Fig. 4). These areas are dispersed and from the under-harvested Wild boar stocks surplus individuals can migrate into the neighbouring areas. It can be assumed that state areas (especially the state forest enterprises) are functioning as reservoirs of population increase.

4. Discussion

The results emphasize that the harvest rate of Wild boar populations was generally lower than that of necessary to stabilize the population. Much greater harvest rates should have been applied to initiate a population decline in order to reduce the Wild boar population to the desired size (Kõhalmy *et al.*, *op. cit.*).

During the last decades the afforested area of the country increased continuously, which provided significant new habitat for Wild boar. Additionally, the large-scale agriculture gave

Figure 4 - Distribution of hunting areas managed by state enterprises in Hungary.

excellent temporary habitat in summer and autumn and foraging opportunities for Wild boar (Csányi, 1989). Although habitat changes provided a sound basis of population dynamics, the relatively low harvest of Wild boar populations can be regarded as key element of the process.

The lower harvest rates in areas managed by state enterprises contributed to the continuous population increase by providing surplus animals. Because of the scattered pattern of these hunting districts, migrating individuals may constantly maintain numbers in areas where these animals are intensively hunted due to the great damage caused in agricultural crops. Paradoxically, energetic elimination of Wild boar results in areas becoming a special kind of "traps," which attract straying individuals from the surrounding areas (Andrzejewski & Jezierski, 1978).

A further analysis also revealed that there is a slight negative correlation between Wild boar density and harvest rate. The previously described effects of management differences can be intensified because large (dense) populations are also under-harvested and the same problems appear on smaller scales (Csányi, 1989).

It can be concluded that management of Wild boar populations requires the cooperation of neighbouring management units. In the future, the dilemmas of Wild boar management can be solved on larger-scales if in ecologically similar regions (game management regions) common strategies are applied in planning and control (Csányi, 1993).

References

ANDRZEJEWSKI R. & JEZIERSKI W., (1978) - Management of Wild boar population and its effects on commercial land. *Acta theriol.*, 23: 309-339.

CSANYI S., (1989) - A hazai vaddisznóállomány dinamikája 1960-1986 között. *Nimród Fórum*, 1989, április: 13-19.

CSANYI S., (1993) - A basis for sustainable wise use of game in Hungary: defining management regions. Landscape and Urban Planning (in press).

KÕHALMY T., IVANCSICS L. & RAKK T., (1987) - Vaddisznóállományunk kezelésének idõszeru kérdései. *Nimród Fórum*, 1987, július: 11-17.

PALL E., (1982) - *A vaddisznó és vadászata*. Mezõgazdasági Kiadó, Budapest.