

## MANAGEMENT OF WILD HOGS ON PRIVATE LANDS IN CALIFORNIA

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**Abstract:** The wild hog (*Sus scrofa*) is the second most important big game species in California, both in total population and in annual kill. It is distributed over a significant portion of the oak woodland zone in California. These lands are primarily under private ownership, and most landowners are in the livestock business. To these people the wild hog represents a potential liability because of its propensity to root up the range and compete with livestock for forage. This paper explores the use of paid recreational hunting as a means of controlling hog damage and providing another source of income to the landowner, while at the same time providing additional recreation for the hunting public.

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### INTRODUCTION

The purpose of this paper is to discuss the growing need for management of wild hog populations in California, particularly on private lands. The majority of the information has been obtained over a period of two years of research at the Dye Creek Preserve in the foothills of eastern Tehama County. However, I have also observed hogs in Humboldt, Mendocino, Monterey, and San Luis Obispo Counties as well as on Santa Catalina Island. At Dye Creek, field work involved observations of over 1,500 groups of wild hogs including over 14,000 individuals. I also trapped and tagged 700 individuals, and recaptured them an average of three times. Also, autopsies were made on 150 individuals.

I would like to acknowledge the continued support of Wayne Long and William S. Keeler of the Dye Creek Preserve. Also I would like to thank Drs. Marshall White and A. Starker Leopold for their council. Finally, I must acknowledge grants from the Dye Creek Field Station, the National Science Foundation and the Union Foundation Wildlife Fund.

History and the Problem. According to the California Department of Fish and Game (1968a,b) the wild hog is now the second most important big game species in California in terms of total population and annual hunter kill. It is

estimated that the wild hog kill has reached 5-15% of the deer kill over the last few years. This is well over the annual black bear kill, the black bear being the next most important big game species in the State.

The wild hog is unique among the other major California big game species in that it is an exotic, introduced by man. Domestic swine were brought to California by the earliest Spanish settlers. Since then, and particularly after the Gold Rush, as settlers homesteaded more and more of the State, hogs were allowed to forage freely in the surrounding oak-wooded hills. This was a common practice throughout the country until well after the turn of the century (Towne and Wentworth, 1950). In several locations around California, commercial swine operations used to free their stock to gather acorns during the fall and winter (McKnight, 1964). Often if the hog market was not good the swine were allowed to "keep" in the hills until market conditions improved. Thus, there has been considerable opportunity over the last 100 years for domestic swine to become established as wild or at least semi-wild populations. Wild hogs from this source are known as feral hogs.

The term wild hog is also used to refer to the European wild boar. It is the wild ancestor to most breeds of domestic swine, and since it interbreeds with them, both are considered variations of the same species (Ensminger, 1961:5). As far as is known all the "European blood" in North America stems from an introduction of 13 young individuals, which were brought from Germany to North Carolina in 1912 (Jones, 1959). In 1924 European stock was brought from North Carolina to the Carmel valley of California (Pine and Gerdes, 1969). European wild boar, or their feral hog hybrids, have recently been, and are being spread, chiefly by hunters, to many areas of California from Monterey County. However, in most areas of the State the feral hog type predominates.

Both types of wild hog are classed as big game animals by the Fish and Game Code, therefore both are subject to the general big game regulations. There is an open season and no bag limit on wild hogs, except in Monterey County where there is a six month season and a bag limit of one per day.

The law is somewhat unclear concerning capture and possession of wild hogs, particularly by a landowner. This is primarily due to the animal's past domestic history. Apparently, if a landowner captures and puts his "mark" on a feral hog, he can claim it as his own livestock. Thus, a landowner could theoretically capture a "big game animal" on his property, then with a simple mark transform it into domestic stock which he could sell on the market. This would be illegal with any other game species. Although few difficulties have arisen so far, if in the future the State finds it advisable to place further restrictions on the take of this species, the present legal situation makes for potential difficulties as far as law enforcement is concerned.

The major problem now, however, does not involve laws as much as economics. The number of hunters in California is increasing. These hunters desire more sport, and a greater variety of game over a longer season. The landowner in the livestock business must increase his production per acre to remain in business with

increasing land values and taxes. Any range destruction by wild hogs, or unnecessary bother with hunters are liabilities which he cannot afford. The following discusses how wildlife management can attempt to integrate these two opposing forces.

Alternative Solutions. I will assume that the landowner in question already has wild hogs on his property. In no case would I suggest the introduction of wild hogs of any type unless the landowner had both the desire and the means to control the population, not only in the near future but in the distant future as well. Wild hogs should never be released by hunters on another's property nor on public lands.

I believe that it is theoretically possible to exterminate a wild hog population. Poison, traps, and hunting with dogs would be the preferred methods. However, to kill every last hog over a large area of rugged habitat, owned by several landowners, would require so much in terms of funds, manpower and time, that it should be considered unfeasible in all but a very few cases. It is unlikely that today's sportsman would expend enough time and energy to hunt down the last wild hog in an extensive, heavily vegetated, or rugged area. The average landowner must be content with the fact that he will always have some wild hogs if his land contains suitable habitat.

Although the wild hog does a considerable amount of rooting, and a large percentage of his diet is grass and forbs, his habits do not completely overlap those of cattle and sheep, the two species generally of interest to the landowner. Assuming a given area encompasses a variety of habitat types, including hills and valleys, open grassland and dense oak woodland, a landowner can carry a given number of wild hogs as well as livestock. The wild hog, if given the opportunity, prefers the lower slopes, dense oak cover (particularly live oak), grass-oak edges, and springs or marshy areas. Cattle, on the other hand, prefer flat valleys or ridge tops, and open grassy areas. The important question for a given area then is: how many wild hogs can a landowner afford to have without sustaining significant damage to his livestock range?

This is a question the wildlife manager can answer if he has some basic information on the habitat preference and food habits of the wild hog. In Monterey County, Pine and Gerdes (1969) found an estimated density of 1-2 hogs per square mile were not causing any significant problems to landowners. On the Dye Creek Preserve I have found densities of 10-20 hogs per square mile. I suggest that 10-15 hogs per section would be the maximum number allowable before significant range damage and livestock competition would occur on most of the California oak woodland type. This density would be lower, with more open grassland, dense non-oak chaparral, or coniferous forest present.

Once a maximum allowable population has been set, then the question is: what is the most feasible method of control? There are several possibilities. The landowner could shoot all pigs on sight and allow others to do likewise. This is the method used by many landowners now. It is not costly, but it takes time and energy to successfully do the job. It certainly does not produce any income,

although it may provide some pork on occasion. Another possibility is to allow enough sportsmen on the land to take care of the problem. This, however, can often be expensive in hunter caused damage and in time needed to bother with the sportsmen, and again, no income.

A third possibility is to round up or trap the hogs and sell them live for their meat value. However, the price obtained for a wild hog on the market would rarely cover the cost of the labor and transportation involved in getting it there. The fourth possibility is to sell the right to hunt wild hogs to the hunting public. Paid recreational hunting is now a reality for several types of game in California. This is primarily due to the fact that increasing hunting pressure has forced many hunters to be willing to pay for a quality experience which is not available on overcrowded public areas. By paying a reasonable fee they find they can hunt on uncrowded land, have an excellent chance of finding a target, and generally be provided with comforts not available on public lands.

The landowner can sell recreational hunting through at least three different systems. 1) He can simply charge a fee and let hunters onto his land. However, this system allows little hunter control, commands a low price per hog, and without advertising may not provide adequate control. 2) He can sell a concession on the hunting to a local guide who would handle all details, or to a larger preserve operation which would simply add his land to their program. A contract could provide for the concessionaire to harvest a minimum number of hogs. 3) He could, if he had sufficient land and other game species, set up his own hunting preserve. He would then probably hire a full time manager who would take care of all details concerning hunters and wildlife management. Dye Creek Preserve is an example of the later system. There the landowner is presently netting about \$100 per wild hog killed.

When controlling wild hogs by means of paid recreational hunting, the landowner finds he can consider the hogs as a resource. Since hunters in California appear to be willing to pay more than the meat value of a hog in order to have the recreation of hunting for it, the landowner may find that he is getting enough of a return to invest some of it into more intensive management of the resource. This would, of course, be of benefit to the sportsman.

Population Structure and Percent Kill. No matter which method of control is used, the landowner needs to know how many hogs he must harvest each year to keep the population below the maximum allowable number. Moreover, if he is selling recreational hunting he probably wants to know the optimum number of pigs he can sell each year and still produce a similar yield the following year. Here again is a question the wildlife manager can answer if given basic information on wild hog population dynamics.

Basically, the optimum average annual kill depends on the reproductive capacity of the population and the population structure. Both of these factors are partially dependent on the sex and age structure of the kill. To illustrate this I will describe three different management schemes. Two represent extremes and the last is an example of the wild hog population on the Dye Creek Preserve.

The first management scheme is one found at any commercial swine operation (Figure 1.). The management objective is to produce the maximum amount of meat possible per pound of feed. This scheme requires considerable control of the population, not only in reducing young mortality, but in assuring an 86.5% harvest of young pigs (Table 1.). The main point this scheme illustrates is that if your population is well below carrying capacity, has a large percentage of young animals, and the majority of the kill is young individuals, then a very large percent kill must be maintained to control the population.

The second management scheme is a hypothetical case, based on the theoretical optimum population structure for the production of trophy boars. Many hunters, although certainly not all, hunt wild hogs for a trophy. The tusks are the actual trophy. In most places, and at Dye Creek Preserve, a tusk two inches or longer, (measured from the gum line around the outer curve to the tip of the tusk), is considered to be a trophy. Since on the average, it takes about 36 months for a boar to produce trophy tusks, a trophy boar must remain in the population for at least three years.

This second scheme also would require considerable control of the population, particularly the sex and age structure of the kill. In most cases this control would be impossible. However, in a preserve situation such as that at Dye Creek, this scheme can be a management goal. With qualified guides for each hunting party, a great degree of selectivity can be achieved. In general terms, the idea of this scheme is to remove a percentage of the young, thus allowing a greater number of individuals to be carried to three or four years of age (Figure 2.). Then all boars over three years, and sows over four years old are harvested. If this scheme was carried out to the letter it would require a 27.4% annual kill to control the population -- assuming a 10% natural mortality of all hogs over six months old (Table 1.).

The last management scheme is probably closer to the normal situation. At Dye Creek, young between six and twelve months old make up nearly half the fall population. It is likely that a similar adult-young ratio would be found in most California wild hog populations. Figure 3 shows the estimated fall population structure and average annual kill structure at Dye Creek over the past three years. It can be seen that the population is stable to slightly increasing, and that hunting pressure has been selective for older hogs, particularly trophy boars. In this situation about 24% of the population must be harvested annually to control it -- assuming a 10% natural mortality of hogs over six months old (Table 1.). In general, the greater the percentage of young in the kill, the greater the kill must be, and vice versa. In a natural population, and being realistic about the probable variation in kill structure, the percent kill could range from 25-50% and successfully control the population.

Hopefully this discussion has accomplished three things. 1) I hope it has exposed wildlife managers to the problem of expanding wild hog populations, and increasing hunter interest in wild hogs in California. 2) I hope it has presented a feasible method of controlling wild hog populations on private lands, whereby both the landowner and sportsmen benefit. 3) I hope it has given wildlife managers examples

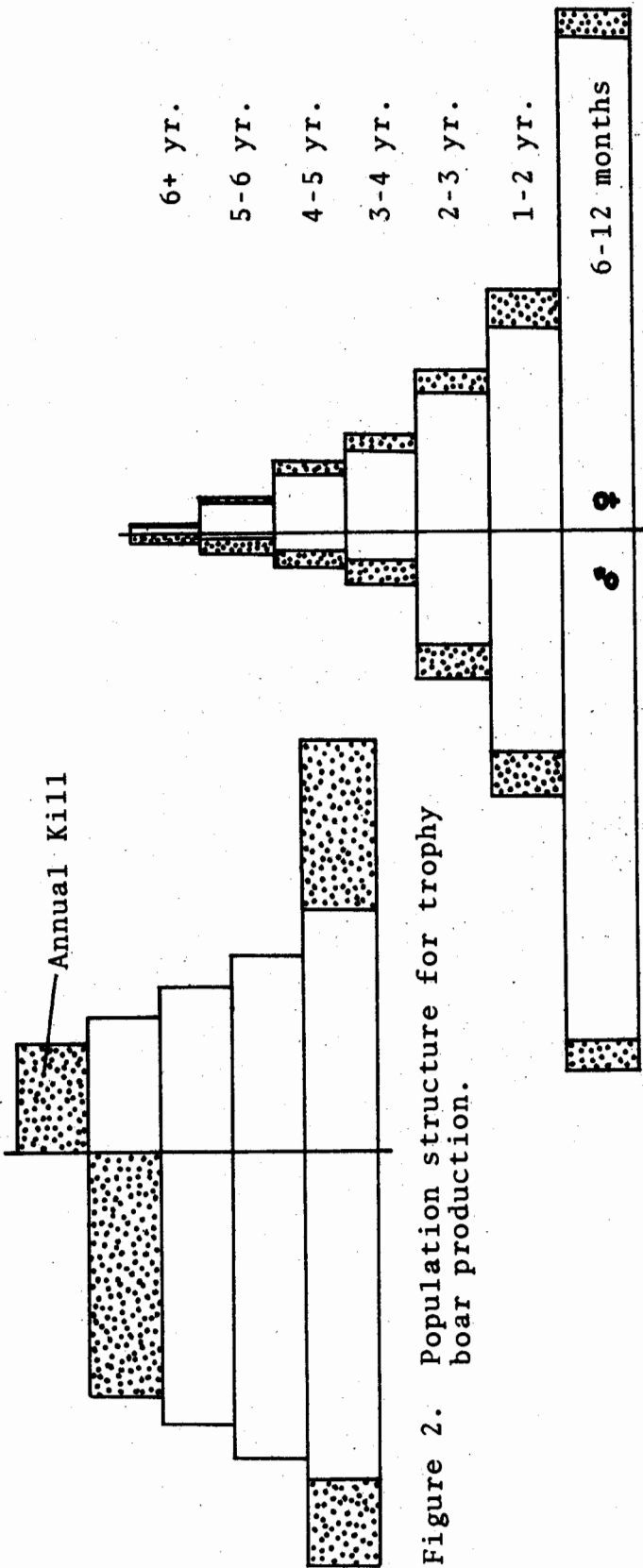


Figure 2. Population structure for trophy boar production.

Figure 3. Dye Creek feral hog population structure.

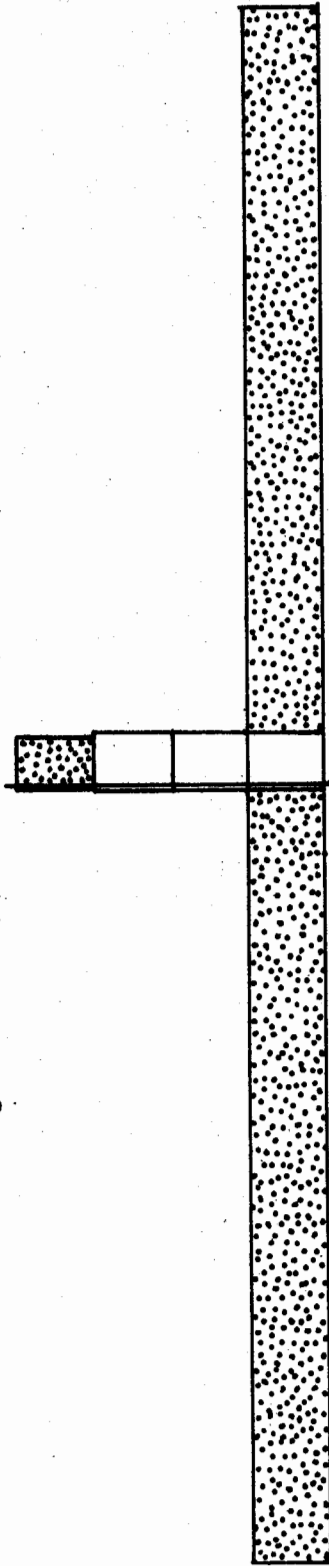


Figure 1. Population structure of a commercial swine operation.

Table 1. Comparison of population parameters for three pig populations.

Parameter	Commercial Swine Operation	Trophy Boar Production	Dye Creek Preserve Estimate
Boars (% tot. adults)	10.0	60.0	46.4
Sows " "	90.0	40.0	53.6
Adults (% tot. pop.)	10.0	62.6	51.2
Young " "	90.0	37.4	48.8
Mean Age (months)	11.2	24.4	21.9
No. 6 mo. old young/sow/year	10.0	1.87	1.77
Harvest of:			
Adults (% tot. pop.)	3.0	16.2	10.4
Adult Boars "	0.25	11.2	6.4
Trophy Boars "	0.25	11.2	2.75
Young "	86.5	11.2	2.1
Annual Increment	90.0%	37.4%	48.8%
Total Annual Mortality	<u>90.0%</u>	<u>37.4%</u>	<u>33.7%</u>
Difference	0.0	0.0	15.1
Population Trend	stable	stable	increasing

of wild hog population dynamics suggesting how large the annual kill should be to control the population, and also, to leave sufficient stock for producing a good yield the following year.

In conclusion, research on wild hog population dynamics is far from complete. I think probably the greatest potential for further research lies with the hunting preserve situation, where accurate kill records can be kept, and a fairly good estimate of the population is available.

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