CROP DAMAGE BY OVERABUNDANT POPULATIONS OF NILGAI AND BLACKBUCK IN HARYANA (INDIA) AND ITS MANAGEMENT

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ABSTRACT: In India, as in other countries, problems associated with locally overabundant wildlife species have emerged as important management issues for reason of some species losing their natural habitat but adapting themselves to the man-altered habitats. Consequently, there is a clash with the interests of local people. Crop-raiding by locally overabundant wild populations of nilgai and blackbuck in Haryana is one such problem analyzed in this paper. Nilgai causes extensive damage to agricultural crops; among these, gram, wheat seedlings and moong are the most preferred ones. Blackbuck nibble mainly on young shoots of various cereal and pulse crops and the damage is much less than caused by nilgai. Possible management strategies such as culling, fencing in nilgai and black buck (enclosures or corrals), and fencing agricultural areas to minimize the problem are suggested. Chain-link fencing of a sizable Reserved Forest (RF) patch, where the animals seek daytime shelter, combined with other local protective methods in the cultivated areas of Nahar hold promise of reducing the pest animal populations. The experiment is likely to establish one approach for dealing with the specific problem in Haryana.

This paper discusses agricultural crop-raiding by locally overabundant populations of nilgai (Boselaphus tragocamelus) and blackbuck (Antilope cervicapra) in several districts of Haryana and the possible management strategies that can limit or reduce the conflict. Based on these strategies, a management experiment is being conducted in one of the districts, namely, Nahar, and its results are presented in this paper.

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INTRODUCTION

In India, after the introduction of Wildlife Protection Act (1972) and through the overall management approach, the populations of most wildlife species have increased considerably, and a few of them have decidedly become locally overabundant. Due to disparate and often incompatible land-use practices, these species have become ecological dislocates. Those that have been successful in adjusting to the man-altered habitats have thrived, and in many places such species have become serious pests of agricultural crops and are competing for resource utilization with domestic stock (Caughley 1981, Howard and Dutta 1982, and Ghosh et al. 1987). There is also an increased use of cultivated lands on reserve peripheries by wild animals. The elephant problem is one of the best examples. Crop damage by deer, nilgai, blackbuck, wild boar, and porcupine has been widely reported from almost all corners of India (Prater 1980, Majupuria 1982, Schultz 1986, and Rajpurohit 1988). Rural societies existing on subsistence agriculture can ill afford to have their cultivations raided by these animals. Realizing the seriousness of the problem, poor farmers or otherwise are now becoming increasingly intolerant to crop raiding. Some have developed outright hostile attitudes toward the animals and want to get rid of these pests. It has now become important that administrators and wildlife managers take the initiative to actively control the wildlife damage to mitigate this problem, which is also in the larger conservation interest.

During 1987-88, extensive survey work was conducted in different districts (Fig. 1), and the data on the occurrence and abundance of nilgai and blackbuck, their habitat and crop depredation patterns in the affected areas were collected.

HABITAT OF NILGAI AND BLACKBUCK

There is only a negligible natural habitat left for nilgai and blackbuck in Haryana, and virtually none of it has a Protected Area status. Tree cover is in small patches and consists mainly of Acacia plantations with scattered Prosopis juliflora, capparus apphyla and Zyzyphus sp. The plantations are either under the control of the forest department or have been raised on community lands. Single standing trees or clusters of Prosopis trees are seen in most crop fields.

The plantations are generally used by nilgai and blackbuck as a daytime refuge. However, these areas do not provide much food for the animals except leaves, seeds and fruits of A. tortilis and A. nilotica and, in addition, Doob grass, Cynodon sp. In places where plantations are not available, the animals seek cover and rest in scrub and wastelands, although these areas are dwindling fast.

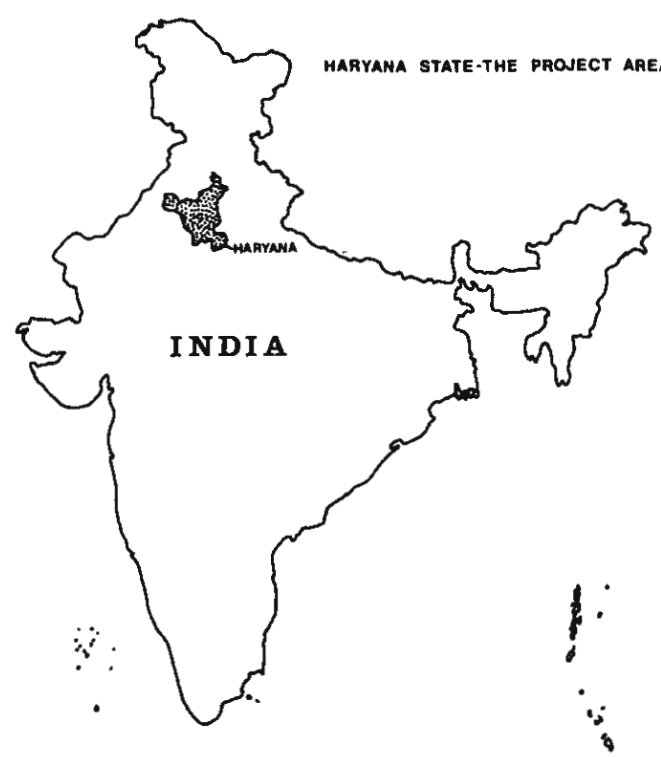

Figure 1. Map of India showing Haryana State and the project area.

CROP DAMAGE

Problem Area Profile

In Sirsa, Hissar, Bhiwani, Rohtak, and Mahendragarh districts of Haryana, crop damage problem is of a high order. Most of these affected areas are situated on soils of alluvial origin in the low rainfall zone. The cropping intensity is comparatively low, particularly in Sirsa and Bhiwani districts and Loharu and Charkhi-Dadri tehsils. In all these areas, the percentage of land under irrigation is below the state average irrigated land. Major cereals are wheat (Triticum aestivum), barley (Hordeum vulgare) and millets, but jowar (Sorghum vulgare) and bajra (Pennisetum typhoides), moong (Phaseolus mungo) and various oil seeds are grown throughout the area. Mustard (Brassica compestris) and cotton (Gossypium sp.) are grown extensively and serve as excellent hiding cover for nilgai.

Crop Damage Pattern

Nilgai is a highly adaptive antelope. Naturally diurnal, it goes for crop-raiding in the evenings and at night. It is found to damage most agricultural crops to a considerable extent. Estimates are being made. However, it shows preference for gram, wheat seedlings, and moong. In Sirsa, severe damage to millet was observed. Cotton is not damaged much but is widely used as cover. Extent of crop damage is variable, perhaps depending upon the animal numbers and crop protection strategy followed in the area. In Nahar, according to villagers, the damage is up to 58% of total yield and is rarely below 10%. In case of blackbuck, the feeding is maximum in the mornings, and during rest of the daytime the animal is found either grazing in the open areas or resting. Damage caused by nilgai is much more than blackbuck. The coexisting blackbuck is some areas is also partly responsible for crop damage.

DAMAGE PROTECTION

Crop Protection

For rural people in the nilgai and blackbuck affected areas, effective crop protection strategies are necessary. Any form of fencing is little used. Brushwood fence used in some places is effective against cattle only but it rarely restricts nilgai and blackbuck. The most common protection strategy for farmers is to guard their fields by remaining vigilant during the crop season.

Constraints in Damage Control

A major constraint on control is that the nilgai is an animal of considerable religious reverence. Most people in the affected area are Hindus. Sirsa and Hisar districts are dominated by Bishnoi Hindu communities. They all are strongly against any proposal for culling of nilgai or capturing them with physical force. However, in spite of all this, most farmers now seem to have reached their tolerance threshold. In case of blackbuck, nationally it is an endangered species.

POSSIBLE MANAGEMENT STRATEGIES

Understanding animal damage problems and their control is the prerequisite of resource management in most man-altered habitats to which wildlife will adapt and often quite successfully (Howthorne 1971). To plan any strategy to mitigate the crop damage problem, it is essential to have adequate information on the population and eco-behavioural aspects of problem animals, the particulars of agricultural lands, their distribution, crops, and the impact on local economy. This information was gathered in a rapid survey of a few problem areas. Earlier, the following strategies for control of nilgai and blackbuck damage problems have been suggested (Chauhan and Sawarkar 1989).

Culling

Selective reduction of nilgai and blackbuck populations would normally be the logical control strategy. Although hunting of these animals is legally banned but realizing the seriousness of the damage problem, this state-wide ban needs to be reviewed. Areas most seriously affected by the problem where such trials would be locally acceptable are required to be identified and then culling of the animals may be carried out either by experts from wildlife staff or hunters hired by the forest department. Out of the total number of the animals in an area, at least 45% of the adult females and 20% of the adult males need to be culled if the overall population is to be maintained at low levels. The monitoring of the population should then be continued to arrive at effective rates of culling since population subjected to low level by hunting typically breed at a higher rate (Dasmann 1971). But overall the objective of hunting is to keep the animal numbers within reasonable limits (Long and Wood 1976).

Confining in Corrals

To segregate sizable populations of nilgai and blackbuck, the need for enclosing the animals in certain selected forest patches identified as their known habitats, is proposed. Further experiments with chemical contraception of the fenced animals in order to reduce reproduction rate, and ultimately their numbers, are required.

Though in problem areas of Haryana not much of forest land is available, it will hardly be possible to fence in the present nilgai and blackbuck populations on a sustainable basis. However, experimental trials to fence in these animals in the refuge areas, e.g., Nahar RF, at high densities and provide them with feed from outside need to be tried.

For driving the animals into fenced areas, the law of diminishing returns will strongly operate with each repeat operation. Erection of fence and enclosing nilgai and blackbuck inside will need to be a protracted process, beginning with fixing fence posts along the perimeter with least disturbance to the animals while they use the area as a daytime refuge, enabling the animals to get used to the sight and sounds of humans. Erection of the fence should gradually progress around the key use areas, attempting to enclose a high percentage of the site population. Concurrently, food must continue to be added as a lure. The closing of fence is critical and should be done when the animals remain least active. Chain-link fence with at least 3-m height will be ideal. After confining nilgai and blackbuck inside the fence, the animals will have to be allowed time to adjust their numbers and resources inside the fence. Mortality due to stress is to be expected. The situation inside the fence and status of outside populations must be monitored. Simultaneously, experiments on suppression of breeding activity of the fenced animals essentially needs to be tried.

Fencing Agricultural Areas

The cost of providing protection to crops by barriers such as trenches, barbed wire and chain-link fences is prohibitive.

However, power fencing, which would be cheapest and effective, can be tried. Although it may be possible to protect certain valuable crops in this way, such measures may export the problems to other unfenced crop areas. Furthermore, the area has considerable domestic stock and it may not be easy to exclude the wild while allowing domestic grazers. However, trials on use of this strategy are needed with a follow-up of monitoring the results.

MANAGEMENT TRIALS AND RESULTS

Based on above suggested methods, the forest department started an experimental trial in Nahar area of Haryana in early 1988. At this time, the estimated populations of nilgai and blackbuck in Nahar area, as per the information of the forest department and from the local people, were over 500 and 240, respectively. Chain-link fencing along the perimeter of a RF patch of 200 ha, which is extensively used by the animals, is in progress with the aim of confining them within the fence. By now, the fencing has been completed only on two sides of the quadrangular patch. Confining large numbers of these animals within the fence is expected not only to reduce the crop damage but the fence so constructed will also act as an exclosure for the remnant outside population. Restricting the animals from entering into the RF areas this way will cause continuous stress on them, and this is likely to result in depressing the breeding rate and adversely affect survivorship.

During the course of the above operation, the animals were found seeking no other place for shelter other than crop fields or other negligible RF land, where they remained under obvious stress due to farmers chasing them out of crop areas or killing attacks of predatory dogs kept by the agriculturists.

To keep nilgai and blackbuck out of crop fields, agriculturists illegally used naked electric wire, carrying 220 V current, all around their cultivation areas, especially in Nahar village. Generally, the animals come out of RFs through certain strategic points along the boundaries in the evenings and at night and tend to negotiate the barrier to enter into the crop fields. As the animals come in contact with the electric wire, they receive a severe electric shock. These animals are found either deformed or dead in the fields or RFs. Many such deaths were recorded in the recent past. This practice is illegal and highly dangerous to human beings. It will also create a severe adverse public reaction to the application of power fence technology, not only in Haryana but also elsewhere in the country.

It seems possible that by the use of the above strategies, the pest populations and problems are likely to be markedly reduced in near future. At present, the number of nilgai and blackbuck in this area is estimated to be only about 60 and 50, respectively. It appears to be the consequence of the fence building activity that has temporarily displaced the on-the-spot populations. It remains to be seen as to what happens once a large number of animals are successfully sequestered. The strategies adopted by the forest department and local people must be viewed as a trial. Although situations under which a particular method is suitable for application will differ, it will help in developing an approach to solve the problem and also enable comparisons between approaches to judge suitability, where comparisons can be made on an even footing. It is also to be noted that success is likely to be limited as a short-term gain. Periodic culling appears to be the only long-term solution. Such a solution as has been cited may not be popular, however, or acceptable by the public.

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