

## Agricultural crop depredation by nilgai antelope (*Boselaphus tragocamelus*) and mitigation strategies: challenges in India

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### Abstract

In India, problems associated with locally overabundant wildlife species have emerged as important management issues for reason of some species losing their natural habitat and adapting themselves to the man-altered situation. Crop-raiding by locally overabundant populations of nilgai antelopes (*Boselaphus tragocamelus*) has been widely reported in many parts of the country. Due to prolonged breeding activity and lacks of potential predators, numbers of nilgai have increased considerably and become locally overabundant in the states of Gujarat, Uttar Pradesh, Haryana, Punjab, Rajasthan, Madhya Pradesh and Delhi. The extent of human-nilgai conflict varied from place to place within these states. Nilgai were found to be capable of causing extensive damage to most agricultural crops. Damage to wheat (*Triticum aestivum*), gram (*Cicer arietinum*) and mustard (*Brassica campestris*) crops was caused not only by foraging but also through trampling, resting in field and daily movement of the animals. In low density nilgai areas, losses to wheat, gram and moong (*Phaseolus mungo*) crops were 20-30%, 40-55% and 40-45%, respectively. Damage to guar (*Cyamopsis tetragonoloba*) and cotton (*Gossypium arboreum*) was 20-35% and 25-40%, respectively. Whereas in high density nilgai areas, damage to wheat, gram and moong was 35-60%, 50-70% and 45-60%, respectively. Mustard was seldom eaten by nilgai but it was damaged by trampling. There were also increased incidences of road mishaps (7-12 cases/state/year) due to vehicular collisions. Though people considered nilgai as a sacred animal, conflict between nilgai and farmers is on the increase, and which is adversely affecting the conservation ideals. Options for damage control and managing nilgai populations are available but each of them has their advantages and limitations. Possible management strategies to reduce crop damage are suggested.

Keywords: *Boselaphus tragocamelus*, agricultural crops, damage, road mishaps, mitigation strategies

### Introduction

In India, problems associated with locally overabundant wildlife species have emerged as important management issues for reason of some species losing their natural habitat and adapting themselves to the man-altered situation. Crop-raiding by locally overabundant populations of nilgai (*Boselaphus tragocamelus*) has been widely reported in many parts of the country. Although people considered nilgai as a sacred animal, conflict between nilgai and farmers is on the increase, which is adversely affecting the conservation ideals.

In India, after the introduction of the Wildlife Protection Act (1972) and through associated management actions, the populations of many 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; Ghosh et al., 1987). Nilgai, an antelope, is afforded holy and sacred rites by Hindus, and has rapidly grown in numbers outside protected areas. Agricultural crop damage by nilgai and blackbuck has been widely reported from almost all corners of India (Prater, 1980; Majupuria, 1982; Schultz, 1986, Rajpurohit, 1988).

Rural societies existing on subsistence agriculture can ill afford to have their crops raided by nilgai. Realizing the seriousness of the problem, poor farmers are now becoming increasingly intolerant to damage to their crops. Some have developed outright hostile attitudes toward the animals. 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 2006-2010, extensive survey work was conducted in different states, and information was collected on the

occurrence and abundance of nilgai, and on their habitat and crop depredation patterns in the affected areas.

### Results and discussion

Nilgai is a highly adaptive antelope. Nilgai was recorded in 114 protected areas in 16 states, namely, Andhra Pradesh, Bihar, Chhattisgarh, Gujarat, Haryana, Himachal Pradesh, Jammu and Kashmir, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Uttarakhand, Uttar Pradesh, Jharkhand and West Bengal in the country. Out of these, Bihar, Uttar Pradesh, Rajasthan, Gujarat, Haryana, Punjab, Madhya Pradesh and Uttarakhand states have an estimated population of 5,500, 254,449, 20,974, 97,004, 41,434, 10,312, 60,677 and 7,728 animals, respectively, and they are the worst affected. They occur in human dominated landscapes and crop fields outside protected areas.

Nilgai populations have increased considerably due to prolonged breeding activity and a high rate of multiple births and lack of potential predators. They have become locally overabundant in these states, thereby causing serious problems which include damage to crops, economic losses and increased incidence of road mishaps due to vehicular collisions. Nilgai caused extensive damage to most agricultural crops. Naturally diurnal, nilgai raid crops after dusk. Damage to wheat (*Triticum aestivum*), gram (*Cicer arietinum*) and mustard (*Brassica campestris*) crops was caused not only by foraging but also due to trampling of the crop during resting and movements of the animals. In low density nilgai areas, losses to wheat, gram and moong (*Phaseolus mungo*) crops were 20-30%, 40-55% and 40-45%, respectively. Damage to guar (*Cyamopsis tetragonoloba*) and cotton (*Gossypium arboreum*) was 20-35% and 25-40%, respectively. Whereas in high density nilgai areas, damage to wheat, gram and moong was 35-60%, 50-70% and 45-60%, respectively. Mustard was seldom eaten by nilgai but it was damaged by trampling. The extent of crop damage varied considerable, depending upon the animal numbers and crop protection strategy followed in the area. Mustard and cotton are grown extensively in the affected region and were found to provide excellent hiding cover to these animals. There were also increased incidences of road mishaps due to vehicular collisions in these states. The accidents ranged from 7 to 12 cases per State every year.

### Recommendations

Understanding animal damage problems and their control is the prerequisite of resource management in most man-altered habitats to which wildlife species adapt successfully (Howthorne, 1971). Large number of options for damage control and managing nilgai populations are available but each of them has their advantages and limitations. Nilgai cannot be killed due to religious reverence. Possible mitigation strategies to reduce crop damage include use of fear provoking stimuli, chemical repellents, fencing agricultural areas, capture and translocation, sustained harvesting, and reproductive management of nilgai populations.

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