



Status and Distribution of Indian Gaur (*Bos gaurus*) in Reserved Forests of Tiruchirappalli, Tamil Nadu, India

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

The importance of assessing the status and distribution of Gaur becomes vital for conservation. The Indian gaur presence and distribution often goes unnoticed in the reserved forests outside the national parks and sanctuaries, these often lead to human animal conflict, hence the study was designed to find the status and distribution of Indian gaur in reserve forest in Tiruchirappalli district, Tamil Nadu. The nocturnal survey and line transect method was followed in the study, which resulted in overall Gaur abundance in Trichy district of 1.51 individual/km² within the Reserved Forest Area in the southern ranges of Trichy that is Thuvankuruchi and Manaparai. The Gaurs often stray into the human settlements in search of water and food which leads to conflicts between gaurs and humans. There is increasing trend of population of Indian gaur hence there is need of conservation measures in highly prone conflicts areas.

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1. INTRODUCTION

The Gaur belongs to bovidae family found widespread across India. It is classified as Vulnerable on the IUCN Red List [1]. The average local extinction rate of distribution of gaurs is at about 60% for the past 50 years in India. Whereas the rates vary from 7% from protected habitats to as high as 98% in unprotected habitats [2]. This significant decline and local extinctions of Gaur were by poaching, competition with livestock, and conversion of habitat resulting in a radically reduced and fragmented distribution ranges, especially outside the protected area [3]. Other major concern is Foot and mouth disease which is transmitted from domestic cattle which causes a serious impact in population of Gaurs [4,5].

Tiruchirappalli is the heart zone of Tamil Nadu, where the lifeline river Cauvery cut across the terrain making it fertile and biodiverse rich. Biodiversity of the area is abundant because of the varied landscape for semi-arid lands, rivers to Hills. The Eastern Ghats run parallel to the northern boundaries of the district which has endemic and endangered flora in it. There is a necessity to assess the biodiversity of the area, particularly that of mammals which often leads to Human- animal conflicts. The mammals which involve in Human- animal conflict here are Indian Gaur, Wild Pig and Spotted deer. Predominately the conflicts here go unnoticed or not given importance. Indian Gaurs which habit the slopes of these hillocks often enter the field nearby involved in crop raiding and sometimes in causing human death also [6,7]. Therefore, the importance of assessing the status and distribution of Gaur becomes vital for conservation and mitigation of Human wildlife conflict

2. MATERIALS AND METHODS

2.1 Study Area

Tiruchirappalli has four ranges namely Thuvarankuruchi, Manapparai, Thuraiyur, and Trichy. The region is a flat deltaic terrain from west to East. This Forest Circle enjoys a tropic hot monsoonal climate with a mean annual rainfall of 900mm. The habitat is of Tropical Scrub forest, Grasslands and Tropical Dry mixed Deciduous forest. The *Acacia ferruginea*, *Acacia*

leucophloea, *Albizia amara*, *Azadirachta indica*, *Canthium dicocum*, *Chloroxylon swietenia*, *Santalum album*, *Tamarindus indica*, *Calotropis procera*, *Capparis sepiaria*, *Carissa carandas*, *Cassia auriculata* are major floral species found with *Lantana camera* and *Prosopis juliflora* are exotic weeds found in this area.

2.2 Nocturnal Survey Method

The Gaurs are basically diurnal but in highly anthropogenic impacted habitats the usually prefer to avoid the overlapping of space and time with the humans, hence the Gaurs found in the study area was mostly nocturnal hence the nocturnal surveys were adapted to estimate the population of Gaur. The survey was done between 20:00 hrs and 04:00 hrs on transects line and along roadside using flashlights and headlamps [8].

2.3 Transect Method

Line transect method was adapted relying on visual detection and counts of gaur [9,10]. Transects were chosen on the existing natural trails on each reserved forest. Each reserved forest had two transect lines which of 2.5 kilometers long. The lines were walked twice for replicate covering total of 115 square kilometres. The transects were surveyed for direct and indirect evidence like hoof marks, dungs and other signs.

2.4 Mapping

The signs and direct encounters were recorded and geo- tagged with the help of GPS Garmin Etrex 10. The geo-tagged locations were transformed into map using ARC GIS software version 10.9. The maps were obtained by feeding the data using the Arc GIS software.

3. RESULTS

The Gaurs abundance gives an overall view of gaur status at Tiruchirappalli district. The abundance shows that the southern region of the district has gaur population which are adjacent of the Western Ghats region of nearby district like Madurai and Dindugal. The Eastern Ghats range starts at the Kannuthu Reserve Forest which bifurcates from the Western Ghats has the largest abundance of gaur.

The Table 1 shows the direct sightings/ No. of visits, it shows that the southern ranges of Tiruchirappalli only had gaurs, with kannuthu with maximum of 17.6 followed with Ponnaiyar dam of 8.4.

The average sighting of 10.66 individuals per visit at Thuvrankuruchi is higher than Manaparai which is of 7.46 individuals per visit, whereas Trichy and Thuraiyur range had no sightings either direct nor indirectly.

The graph shows that where the human activity is less, the abundance of gaur is more, this proves that the gaur usually avoids the human

intervention and normally does not come in direct contact with humans, Locals stated that the gaur comes in direct contact only when there is scarcity of water and food.

The map shows the high prone conflict area in Trichy district, which needs to be monitored at high preference, the migration of gaurs from one reserve forest to another in search of food and water also leads them in crossing the highway roads and human settlements. the south western region of Trichy district shows high population and it is very closely connected with the other districts like Dindugal where the western ghats and eastern ghats bifurcate.

Table 1. Direct sighting/No. of visit of Indian Gaurs at Tiruchirappalli District with Reserve forests wise

Ranges	Reserve forests	Direct sighting/No.of visit
Trichy (Central)	Thachankuruchi	0
Trichy (Central)	Pulivalam	0
Trichy (Central)	Omandur	0
Manaparai (South)	Ponnaiyar Dam	8.4
Manaparai (South)	Kumarikaati Hill	7
Manaparai (South)	Puthanatham	7
Thuvrankuruchi (South)	Marungapuri	5
Thuvrankuruchi (South)	Kannuthu	17.6
Thuvrankuruchi (South)	Thatchamalai	8.2
Thuraiyur (North)	Shobanapuram	0
Thuraiyur (North)	Sholaimathi	0
Thuraiyur (North)	Kannimar Solai	0

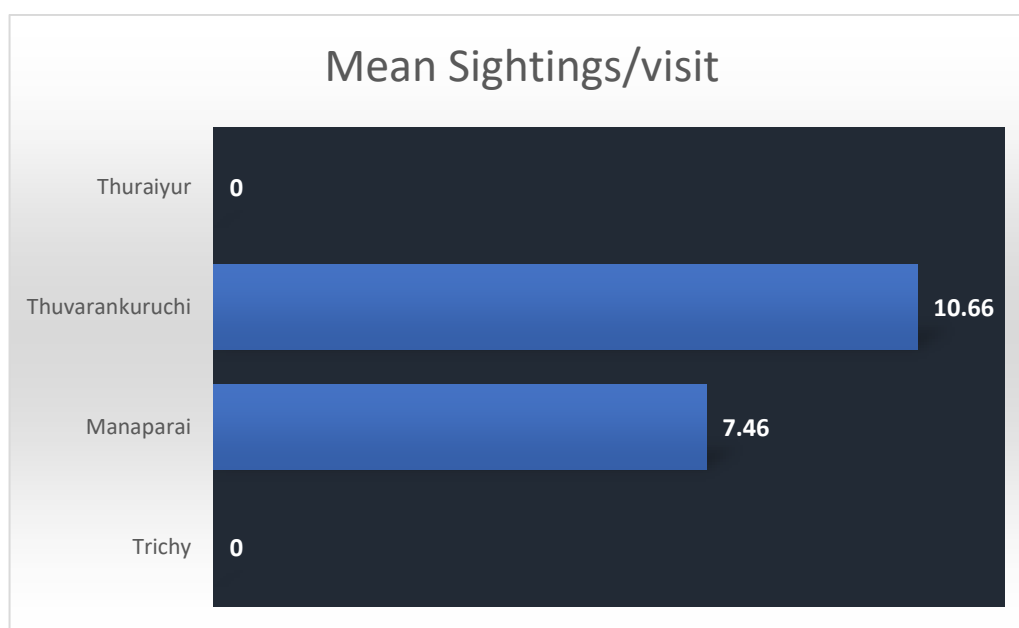


Fig. 1. Average sighting of individuals per visit at each Range

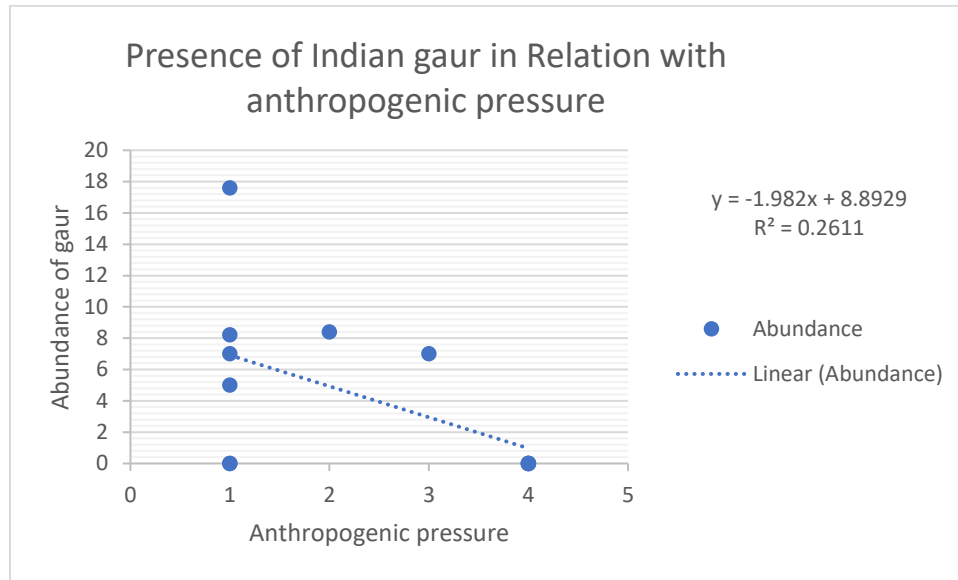


Fig. 2. Presence of Indian gaur in Relation with Human activities

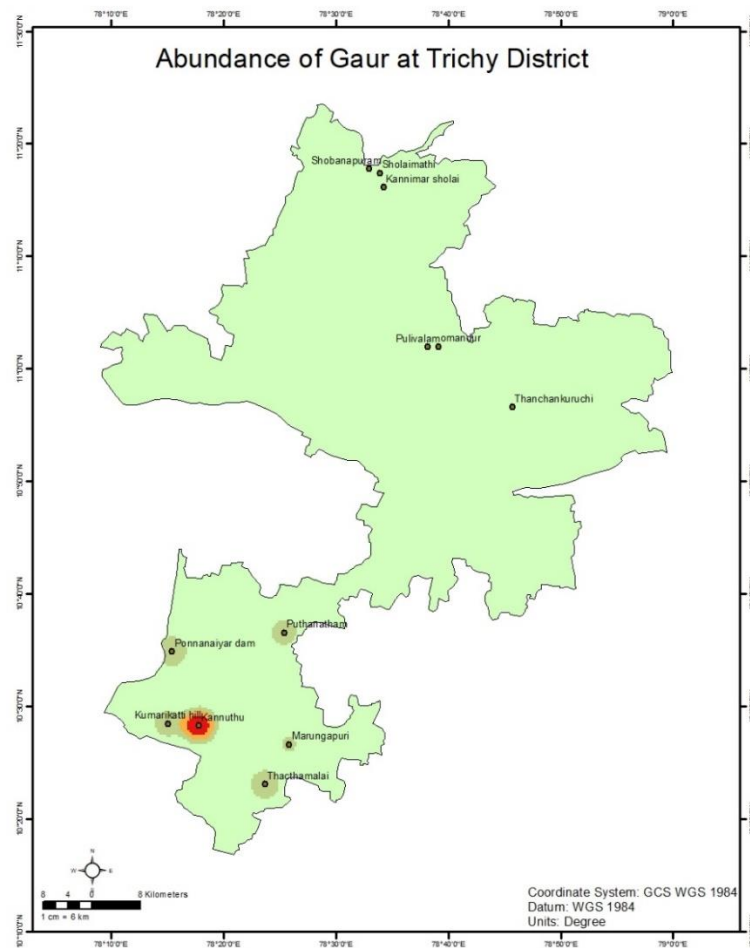


Fig. 3. Map showing the Human/Gaur conflict prone area at Tiruchirappalli district with respect to abundance

4. DISCUSSION

The density of Indian gaur varies across different regions in India. In Trishna Wildlife Sanctuary, Tripura, the density was found to be 5.9 individuals per km² [11]. In Bhadra Tiger Reserve, southern India, the density of gaur was estimated to be 1.48 individuals per km² [12]. In Kuldiha Wildlife Sanctuary, Odisha, the group size and crowding of gaur indicated a low population density [13]. In Mookambika Wildlife Sanctuary, Western Ghats, the most frequent herd size of gaur was found to be 2-10 individuals [14]. In the Melghat Tiger Reserve, Central India, the density of gaur was estimated to be 5.8 individuals per km² [15] and 6.35 individual /km² in manas national park [16]. The overall Gaur abundance in Trichy district is 1.51 individual/km² within the Reserved Forest area which is lower than the other reserves when compared, but the overall finding gave an insight of increasing trend of population of gaurs, this is because the juveniles and subadult were more in number compared to the adult, therefore there is an immediate need to look upon conservation in Trichy district.

5. CONCLUSION

The Indian Gaur population shows a increasing trend in the reserved forest of Tiruchirappalli district, which will eventually reaching the carrying capacity in near future which will lead to conflicts in large. Human Gaur conflicts also go as unnoticed, with some primary data collected while interacting with the local Human settlements say that Gaurs comes out at nights in summer in search of water and food as the reserve forest nearby dries up and left with no feed available, which always leads to crop raiding at periphery of the reserve forest. Sometimes this conflict leads intense damages to both humans and gaurs, Human use strategies like electric fencings, trenches, loud speakers and fire crackers which obviously changes the behavior of the animal. The animals retaliate with agnostic behavior causing property damages and sometimes human death also. This has been as major concern and critical problem to be looked upon.

The conservation of this gaur population is ignored due to concentration of other species like Spotted Deer and Slender Loris which are in very large numbers. The collective effort from the Forest department and Civilian will ensure the viable population of gaurs to thrive through.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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