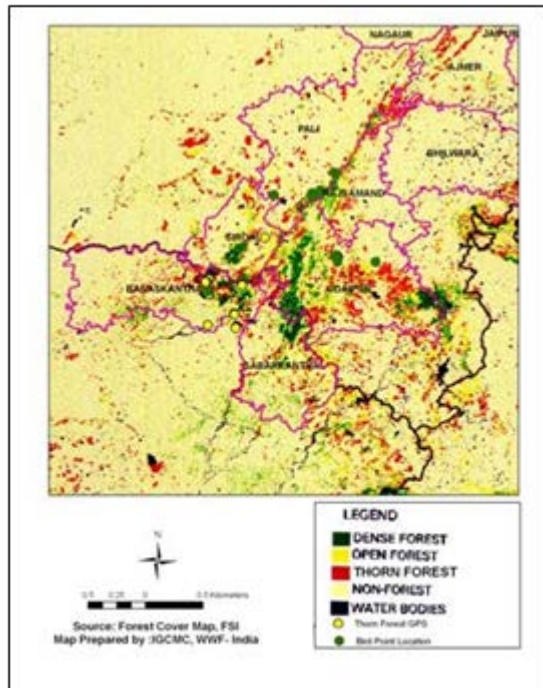


## Project Update: April 2011

Generally species that are endemic, with narrow geographic distribution and high habitat specificity are most at risk due to habitat change. The southern Aravalli hills holds one of the major portions of thorn forests in India, which is considered as one of the threatened habitat and is on the verge of high degradation due to various anthropogenic activities such as cutting, lopping, mining and encroachment for agriculture. The tropical thorn forest has never been considered as ecological significant as other forest types in India, even though this habitat harbour threatened and endemic faunal species like White-naped Tit (*Parus nuchalis*).

This study on White-naped Tit (WNT) involved a set of activities initiated with a survey to estimate population of the bird, spread awareness about WNT and its habitat among local communities, experimental implementation of nest boxes within its territory to check the inter and intra-specific competition and acceptance by the WNT. In our first two-progress reports we have detailed out the outcome of nest box experiment and our awareness campaign.



For the past three months our team started surveying other parts of southern Aravalli hills. Major sites covered were Balaram-ambaji Wildlife Sanctuary, Abhaghata Reserve Forest and end point of Sothern Aravalli hills i.e. Taranga Hills in Gujarat, while Kumbhalgarh wildlife sanctuary in Pali district, Banki forest division, Bathera Reserve (Private Forest), thorn forest areas in and around Udaipur in Rajasthan. This survey resulted in 75 individuals of White-naped Tit through 31 sightings. While assessing the population of the bird, we had collected information on habitat i.e. host tree species, % of canopy available, height at which bird seen, tree density (within 20m radius), contiguity of forest, preferred habitat by the bird species and threats prevailing in the area. As this species has very high specificity to the thorn forest, most of the time this bird was seen feeding either on *Acacia*

species, or *Capparis decidua* but predominantly exploring on thorn species.

In this report we will be discussing about the areas surveyed in southern Aravalli hills (South Rajasthan and North Gujarat), habitat variables used and related threats where this species was seen (**Map 1**). First part of the report contains the areas surveyed while Part II deals with the habitat variables.

### **PART- I: Areas Surveyed in Southern Aravalli Hills (Map 1)**

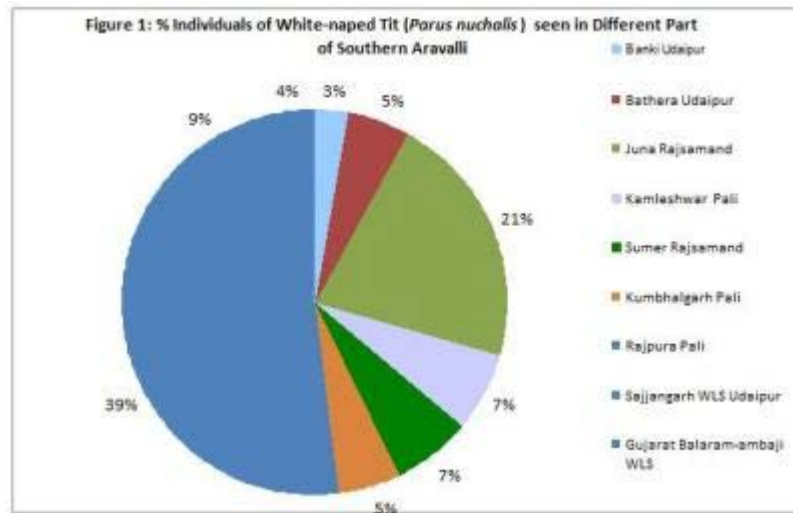
Aravalli hills starts from northern part of Gujarat, runs across Rajasthan and ends in Delhi where it is known as Raseena Hills. Most of the part of this hill range lies in Rajasthan and this hill

range bisects this state in two unequal parts. Our project is being carried out in southern part of this hill range that covers South Rajasthan and North Gujarat. Though we have covered the major part of the southern Aravallis but here we have combined and discussed about the data available till now.

Most of the sightings were in the Kumbhalgarh WLS, with 39% of sightings in Rajpura, Pali followed by 15% in Juna, Rajsamand (**Figure 1**). Rajpura area in Kumbhalgarh Wildlife sanctuary (KWLS) harbours a good population of White-naped Tit (29) because of presence of a long contiguous patch of forest at the foothills of Aravallis (**Figure 2**) followed by Juna (16) area in Rajsamand district, which is also in Kumbhalgarh WLS.

#### **A. Southern Aravalli hills in South Rajasthan:**

- i. **Kumbhalgarh Wildlife Sanctuary, Pali:** This sanctuary has a significant ecological affect on Aravalli hills of this region as it prevents spreading of Thar Desert (lies in the west) towards the eastern part. Hence western, as well as parts of inter-junction of this hill ranges holds a good cover of tropical thorn forest. Most of the Acacia species i.e. *Acacia senegal*, *Acacia leucophloea*, *Acacia tortilis*, *Acacia catechu* and other thorn species including *Capparis decidua*, *Prosopis cineraria*, *Maytenus emarginata* and *Zizypus mauritiana* exits in this region that forms an excellent habitat for endemic White-naped Tit (*Parus nuchalis*). Major threats include grazing from migratory and local livestock, cutting, lopping, browsing and mining for stones.
- ii. **Baanki Forest Division, Udaipur:** This small forest patch includes thorn species of *Acacia senegal*, *Acacia catechu*, *Anogeissus pendula*, *Zizypus mauritiana*, *Euphorbia caducifolia*, and *Prsosopis juliflora*. Though this is a small fragmented patch of thorn habitat, but it forms an abode for a small population of this species. Major threats in this forest division include cutting and lopping from the local communities residing in the vicinity of this area.
- iii. **Bathera thorn habitat (private property):** This forest is mostly dominated by *Anogeissus pendula* interspersed with *Acacia* and *Zizypu* species. During our surveys, we have found that *Anogeissus pendula* forest holds comparatively less numbers in terms of White-naped Tit. We could see only a pair of White-naped Tit in this forest patch.



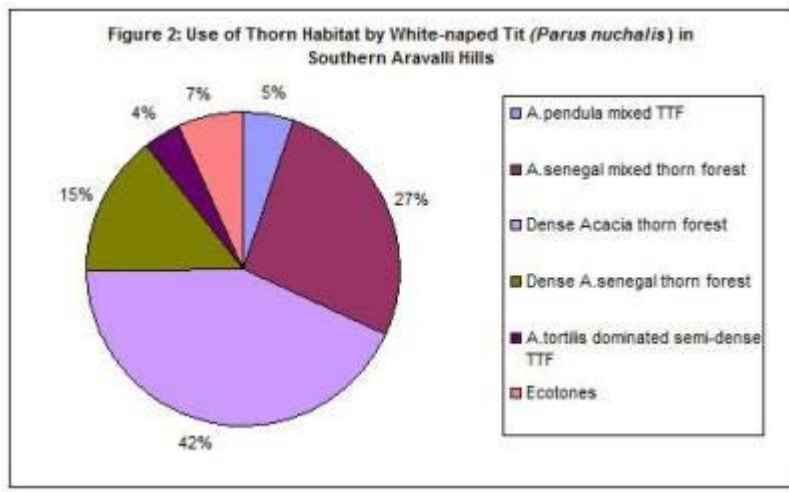
## B. Southern Aravalli Hills, North Gujarat:

- i. **Balaram-Ambaji Wildlife Sanctuary:** This Wildlife Sanctuary (WLS) occupies an area of 542.08 km<sup>2</sup> and harbour different types of forest including large tract of tropical thorn forest spread mainly along the lower slopes and foot hills of Aravalli hills. North-western part of this sanctuary harbour *Acacia tortilis* dominated thorn forest that was planted in early 80s. Earlier to this, *Acacia senegal* and *Acacia catechu* were the dominant thorn forest species in this WLS. Presently this WLS is highly degraded due to cutting, lopping, and encroachment for agriculture and grazing and browsing by migratory livestock, but still harbours good population of White-naped Tit.
- ii. **Abhaghata Reserve Forest:** This is the largest thorn forest tract in Southern Aravalli and could be one of the strong holds for the population of White-naped Tit. Dominated by *Acacia senegal* and *Zizypus mauritiana* this reserve forest could act as a good breeding ground for this species, but this area is surrounded by stone quarries and numerous stone crusher that are exerting immense pressure on bird's habitat. Suspended particulate matter (SPM) and dust settle down on the plants and restrict the photosynthesis process, which leads to slow death of the plants. Consequently resulting in the shrinking of WNT's favourable habitat.
- iii. **Taranga Hills:** These hills are the end point of Aravalli hills in the southern range and dominated by *Anogeissus pendula*, *Acacia senegal* and *Acacia jacquemontii*. This is the driest part of the Southern Aravallis with stunted tree growth because of the less soil depth. Like other part this area also has disturbance from cutting, lopping and, grazing and browsing by migratory livestock.

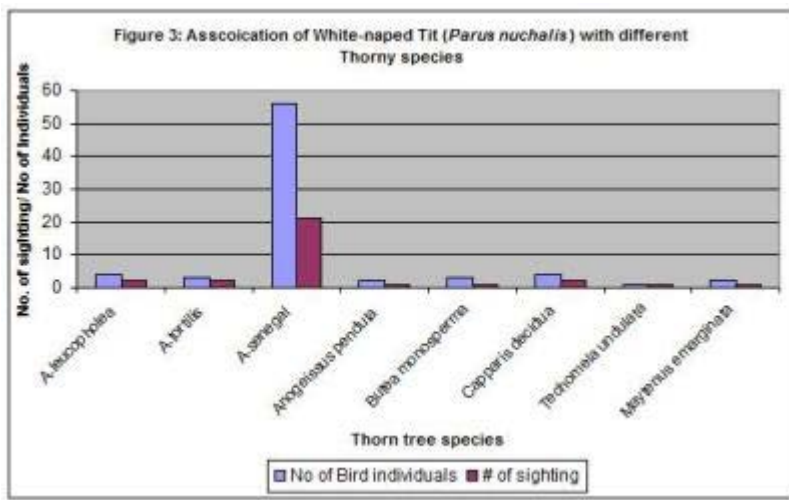
### Part II<sup>nd</sup>: Habitat Variables Assessment

Southern part of Aravalli hills has vast tracts of tropical thorn forest but mostly in the form of fragmented patches that results in isolated pockets and population of White-naped Tit. During our Survey, we assessed few habitat variables to check the suitability and preference of habitat by this bird species.

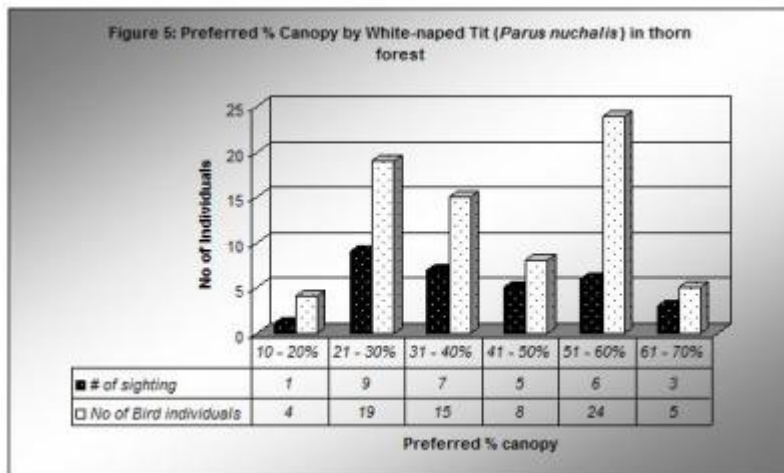
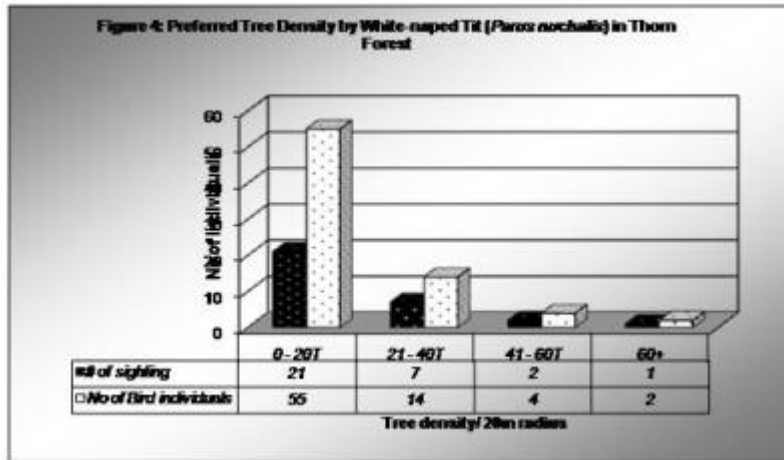
- i. **Most used Habitat By White-naped Tit (*Parus nuchalis*):** This endemic species used mostly the Acacia mixed thorn forest, where about 42% of the population was recorded followed by Dense *Acacia senegal* thorn forest with 15% of WNTs (**Figure 2**). Acacia dominated forest type depicts the mosaic of *Acacia tortilis*, *Acacia senegal*, *Acacia catechu*, *Prosopis cineraria* and *Capparis decidua*. Presence of more number of individuals in this type of forest type could be due to presence of diversity of different life forms of insect fauna.



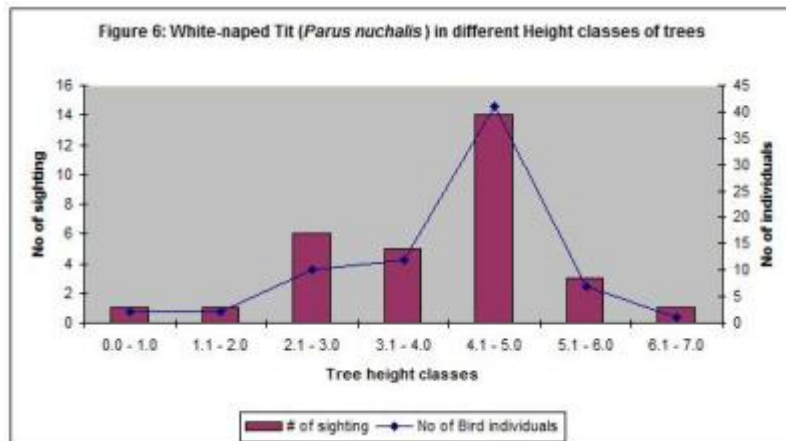
- ii. **Association of White-naped Tit (*Parus nuchalis*) with Thorny Species:** As discussed earlier that White-naped Tit is highly specific to thorn forest (**Figure 2**), it is evident from the figure (**Figure 3**) that most of the sightings were in Acacia dominated forest. *Acacia senegal* and *Prosopis cineraria* are the native species of Aravalli hills, whereas *Acacia tortilis* was planted. *Acacia senegal* was the dominant species in most of the places; hence sightings as well as the number of the birds were comparatively high in the forest with *Acacia senegal* (**Figure 3**).



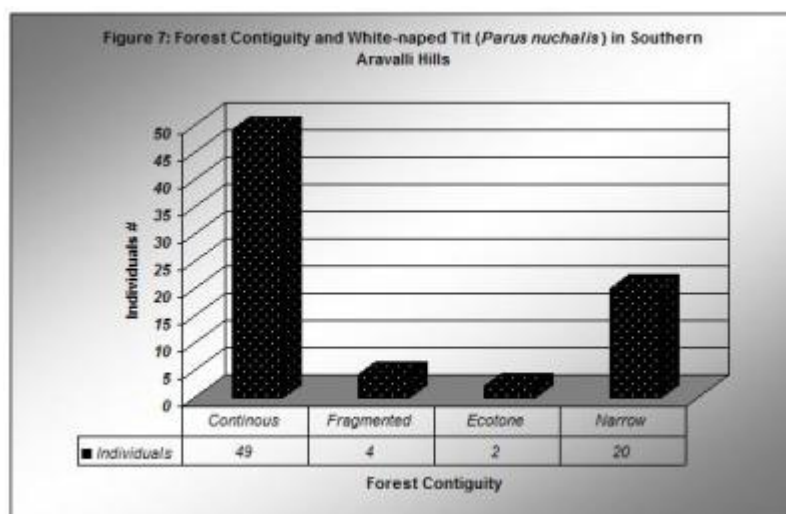
- iii. **Association with Tree Density and Percent Canopy Cover:** Maximum birds were seen where tree density was less. The sites with less density of trees had larger canopied and taller trees, which was probably due to enough space between trees. This is evident from the presence of more birds in areas where densities of trees was 20-40 trees and canopy of trees was 20-60% (**Figures 4 & 5**).



- iv. **Preferred Tree Height Classes:** This part of the study revealed that more sightings and birds were recorded from areas with trees height of 4.1 – 5 m. The trees of this height were mostly found in areas, which were less disturbed and with better soil depth particularly in lower part of the hills to flat areas (**Figure 6**). Most of the tree species have not grown much taller and it could be due to less availability of ground water and low rain-fall, therefore most of the time we have seen bird exploring at a height of 2-5m only (**Fig 6**).



- v. **Contiguity of the Forest:** Another important part of the study was the presence of more individuals in contiguous forest than in the forest, which were narrow, fragmented or ecotones of thorn with deciduous forests (**Figure 7**).



Based on the survey till now, it is evident that most of the thorn forests in Aravalli hills are fragmented because of various anthropogenic activities that could have resulted in less number of White-naped Tit (**Figure 7**). Here, the contiguous forest means the tract of tropical thorn forest with less disturbance and continuous forest without any encroachment, whether the patch was of 10 ha or 5 ha. Still some areas are to be assessed for the population of the bird. From the survey done till now it was apparent that the number of this bird has declined compared to earlier records (Kala *et al.* 2008) of this species from the same areas.

Population of White-naped Tit (*Parus nuchalis*) is dwindling because of the habitat fragmentation in the form of anthropogenic pressure prevailing in this region, and if proper conservation measures are not taken, then survival of this species would be difficult and move towards the extinction. Local communities are very much aware of this pressure but they are also facing a threat of low availability of resource, but due to rapidly growing human and

livestock population, they themselves are in a dilemma of this concept of “conservation” that “how to conserve”, until their basic requirements of resources are not met. However, our efforts in the form of education and awareness has made the local communities to think, there is lot to be done on ground to improve the availability of the resources, in addition to further systematic education and awareness on a regular basis, which would ensure the survival of the threatened thorn forest and the highly dependent White-naped Tit.