CHAPTER 2

STUDY AREA

2.1. General, Location and Topography:

Sariska Tiger Reserve (Sariska TR) is situated in Aravalli hills in Alwar district of Indian state of Rajasthan between Longitude: 79° 17' to 76°34'N and Latitude: 27° 5' to 27° 33' E (Figure 2.1). The total area of Tiger reserve is 881 km^2, with 274 km^2 as a notified National Park. The major part of the area is occupied by rocks of the Delhi system and Aravalli system comprising of quartzites, conglomerates, grits, limestone, phyllite, granites and schists (Pascoe 1950 and Sankar 1994). Sariska TR is characterized by rugged terrain, valleys and plateau with the altitudinal variation from 540 m to 777 m. The two main plateaus are Kankawari (524 m above mean sea level) and Kiraska (592 m above the mean sea level). The most remarkable characteristics of the hills are their homogenetic regularity of height, level summits and uniform appearance, stretching out from northeast to south-west, in more or less parallel lines (Soni, 2000). The depth of soil layer is more than 1 m in valleys, whereas it is only a few centimeters deep on the hill slopes. The soil is sandy loam and alkaline with pH varying from 7.25 to 8.00 (Yadav and Gupta 2006). The Alwar Thanaghazi- Jaipur State Highway passes through the reserve, and 2000 vehicles ply on it every day (Johnsingh *et al.* 1997). Another main road passes through the reserve is Sariska-Kalighati- Pandupol road which is 20 km and along the wildlife rich valley of the reserve.

2.2. Climate

The climate is subtropical, characterized by a distinct winter, summer and monsoon. Winter commences from November. In winter, the temperature has been observed to drop to 3° C. Summer commences from mid March and continues till end of June. July and August are rainy season. Summer is followed by monsoon from south west in July and August. The study area also receives occasional winter and summer rains. Average annual rainfall recorded is 650 mm (Sankar 1994).

2.3. History and archaeological richness

Sariska Tiger Reserve was created in 1978. In the pre-independence period, the forests within the Reserve were a part of the erstwhile Alwar State and maintained as a hunting preserve for the royalty. After independence, Sariska was declared as a Wild Life Reserve on 7th November, 1955, under the Rajasthan Wild animals and Birds Protection Act, 1951. The Reserve status was upgraded to that of a Sanctuary in 1958. Sariska was included in the list of Tiger Reserves by Government of India in 1978 as the 11th Tiger Reserve. In 1982, an area of 274 km^2 was declared as Sariska National Park vide Preliminary Notification *NO. F11 (22) Raj-8/78 Jaipur Dated 27 August 1982 under Wild Life Protection Act 1972 (Central Act No. 53) section 35 (1)*. Within Sariska TR, there are several places of historical interest. The Pandupole temple which is a major attraction for tourists and pilgrims lies in the National Park area of the Reserve. The Kankawari fort, originally built by *Maharaja* Jai Singh II of Jaipur, located in the National Park area of the Reserve, where in the *Mughal* Emperor Aurangzeb had briefly imprisoned his elder brother Darashikoh during the struggle for succession of the throne.

2.4. Major vegetation types

The vegetation of Sariska correspond to (1) Northern tropical dry deciduous forests (subgroups 5B; 5/E1 and 5/E2) and Northern Tropical Thorn forest (subgroup 6B) (Champion and Seth 1986). *Anogeissus pendula* is the dominant tree species covering over 40 per cent area of the forest (Sankar 1994). *Boswellia serreta* and *Lannea coromandelica* grow on rocky patches. *Acacia catechu* and bamboo are common in the valleys. Some valleys support *Butea monosperma* and *Zizyphus mauritiana*. *Dendrocalamus strictus* is extremely limited in distribution and is found along well drained reaches of the streams and moist and cooler parts of the hills. *Albizia lebbeck, Diospyros melanoxylon, Holoptepia integrifolia* and *Ficus spp*. are found in moist localities (Sankar 1994).

Parmar (1985) and Rodgers (1985) have classified vegetation of Sariska as follows:

1. *Anogeissus pendula* forest
2. *Boswellia serrata* forest
3. *Acaccia catechu* forest and

a) *Miscellaneous forest,* which can be further sub-divided into three categories viz.

b) *Butea monosperma* forest

c) Forest along nallas and…….

d) Scrub land

Nine different vegetation and land cover categories have been delineated in Sariska TR (Sankar *et al.* 2009). They are *Anogeissus* dominated forest, *Boswellia* dominated forest, *Butea* dominated forest, *Acacia* mixed forest, *Zizyphus* mixed forest, Scrubland, Agricultural land, Water body and Barren land.

***Anogeissus* dominated forest:** The *Anogeissus pendula* that occupies 35.4% of the overall vegetation types is the dominant vegetation type in the entire STR distributed largely in gentle slopes. This species is found in association with *Acacia catechu* and *Lanea coromandelica,*. The under storey is formed by *Adathoda vasica, Grewia flavescens, Capparis sepiaria* and *Nycatanthus sp*. Ground cover mainly comprises of *Aristida sp*., *Setaria sp.,* and *Chloris sp*.

***Boswellia* dominated forest:** *Boswellia serrata* that occupies 15.4% of the overall vegetation types is found largely in steep slopes and plateaus. This species is found in association with *Anogeissus pendula*, *Doispyros melanoxylon*, *Acacia catechu*, *Wrigtia tinctoria, Bauhinia racemosa, and Ehretia laevis*. The under storey comprises of *Eurphobia nerifolia*, *Grewia flavescens, G. tenax* and *Capparis sepiaria.* Grass cover is sparse and is formed by *Aphluda sp* and *Chloris sp.*

***Butea* dominated forest:** *Butea* dominat forest occupies 7.9% of the Tiger Reserve. This species is found in association with *Zizyphus mauritiana, Cordia mixa, Phoenix Slyvesteris* (along the streams), *Holoptelea integrifolia* and *Cassia fistula*. The *Capparis sepiaria, Grewia flavescence, and Rhus mysorenses* are the common under storey. Ground layer comprises of *Heteropogon sp* and *Chloris dolichostachya*.

Scrubland: This vegetation type occupies 19.1% of the forest cover in which the tree species such as *Prosopis juliflora, Acacia leucophloea, Acacia nilotica, Acacia senegal, Maytenus senegalensis and Balanites aegeptiaca* are sparsely

distributed. The under story is formed by *Capparis decidua, C. sepiaria, Rus mysorensis, Grewia favescens, G. tenax, , Adathoda vasica and Dicrostachys cinerea.* Grass cover is sparse and is mainly formed by *Cynaodon sp, Chloris sp, Sporobolus sp,* and *Synchrus sp.*

***Acacia* mixed forest:** The *Acacia* mixed forest occupies 4.1% of the total vegetation types in Sariska TR. The *Acacia leucophloea* is the dominant vegetation type is found in association with *Prosopis juliflora, Acacia senegal, Dicrostachys cineria* and *Maytenus emarginata.* The understorey is formed by *Capparis sepiaria, D. cinera and M. emarginata,* Grasses found are *Apluda mutica, Cynodon dactylon* and *Desmostachya bipinnata*.

***Zizyphus* mixed forest:** This vegetation community that occupies 5.9% of the total vegetation type in STR is dominated by *Zizyphus mauritiana* in combination with *Acacia catechu, A. leucophloea* and *B. monosperma.* The understorey is formed by *Adathoda vasica, Cassia tora, Capparis sepiaria and Zizyphus nummularia. Cynodon sp, Eragrostis sp, and Chloris sp* are typical grasses found along with this type of vegetation type.

Riverine forest: In sariska, forests along the nallahs is more of wet conditions and have patches of trees like *Antherocephalus kadamba*, ficus species, *Phoenix sylvestris* and *Syzygium cumini* trees which are the typical trees species in those areas.

2.5. Fauna

Wild herbivores found in Sariska are chital (*Axis axis*), sambar (*Rusa unicolor*), and nilgai (*Boselaphus tragocamelus).* Omnivores found are wild pig (*Sus scorfa)* and jackal *(Canis aureus)*. Large carnivores found are eight reintroduced tigers (*Panthera tigris*), leopard (*Panthera pardus*), striped hyaena *(Hyaena hyaena)*. Small carnivores are caracal (*Caracal caracal*), jungle cat (*Felis chaus*), common mongoose *(Herpestes edwardse*), small Indian mongoose (*H. auropunctatus*), ruddy mongoose (*H. smithi*), palm civet (*Paradoxurus hermaphroditus*), small Indian civet (*Viverricula indica*) and ratel (*Mellivora camensis*). In 2009, recently desert cat (*Felis selvestris*) was reported from Sariska (Gupta *et al.* 2009). Earlier, the wild dog or

dhole (*Cuon alpinus*) was used to occur in STR (Sankar 1994) but there have been no sighting in the recent past. Rhesus macaque (*Macaca mulatta*) and common langur (*Seminopithecus entellus*) are the two primates found here. Procupine (*Hystrix indica*), rufous tailed hare (*Lepus nigricollis ruficaudatus*) are also found in Sariska TR.

Eleven species of small rodents captured during present study *viz* Indian gerbil (*Tatera indica*), Indian bush rat (*Golunda ellioti*), spiny tailed mouse (*Mus platythrix*), house mice (*Mus musculus*), little Indian field mice (*Mus booduga*) long tailed tree mouse (*Vandeleuria oleracea*), sand coloured Rat (*Millardia gleadowi*), soft fur field rat (*Millardia meltada*), brown rat (*Rattus norwegicus*), house rat (*Rattus rattus*) and pygmy gerbil (*Gerbillus nanus*).

Due to presence of villages inside and on the periphery a large variety of domesticated animals are also occurs within the park. These include buffaloes, cows, goats, camel, dogs and domestic cats.

Sariska also holds a variety of bird species including some winter migrants. Sankar *et al.* (1993) recorded 211 species of birds, of which 120 resident, 73 were migrant visitors and 18 considered as vagrants. It has very high density of peafowl as well as grey francolin (Kidwai 2009).

Though there is no perennial river or water stream (Ajith kumar and Sankar 1993), there are a number of ephemeral streams and pools found in Sariska TR. Except for a few natural springs, water in these locations dries up in summer (Sankar 1994). The common fish species found in water bodies in this park are *Noemachilus botia, Labio boggut, Puntius sarana, Garra gotyla* and *Rasbora daniconius.*

2.6. Human settlements

There are 31 villages within the Tiger Reserve boundary and out of them ten are situated in the notified National Park. Earlier there were twelve villages due for relocation since 1984 in the notified National Park. Of these, village Umri and Rotkala were relocated during 2013. In the revenue villages the occupation of the people is based on agriculture but in the grazing camps it is animal husbandry. A large number of buffaloes and goats, cattle, sheep and a few camels are kept in the villages. The human population is over 8500 in the villages of Sariska TR along with

a population 30000 livestock including buffalo, cow, goat and sheep (Sankar *et al.* 2009). These villagers depend totally on forests for their livelihood. The people inhabiting these villages are traditionally pastoralist and their main source of income is selling milk and its products like “Mawa and Ghee”.

2.7. Tourism

Tourism is not so regulated and most of the tourists coming to the reserve, come to pandupol temple especially on Tuesdays and Saturdays, when entry to the reserve is free. In the peak season which is from July to August there is a fair held at the pandupol temple and Bartari temple that results in heavy traffic inside the core area even during night hours. However on other days only day time tourism is allowed and the reserve remains closed after dusk.

2.8. Administrative units

Sariska Tiger Reserve comes under Sariska Circle and Sariska Division (Figure 2.1). Sariska TR has four ranges: Sariska, Akbarpur, Tehla and Talvriksh. Sariska range constituted of 20 beats, Akbarpur 17 beats, Tehla 25 beats and Talvriksh 13 beats.

Figure 2.1. Location, administrative boundary and intensive study area in Sariska Tiger Reserve, Rajasthan.