

Chapter 2- Study Area

2.1 Gujarat

The study has been conducted in Gujarat state (Figure.2.1) located between 20°07'N to 24°43'N latitude and 68°10'E to 74°29'E longitude with total geographical area of 1,96,244 km². Gujarat represents the western most limit of sloth bear distribution across the world. As per the 2022 census, more than 300 sloth bear individuals are inhabiting different areas mainly located towards the northern and eastern border of the state. Research work majorly focuses in and around five protected habitats categorised under three zone i.e. North, Central and South.

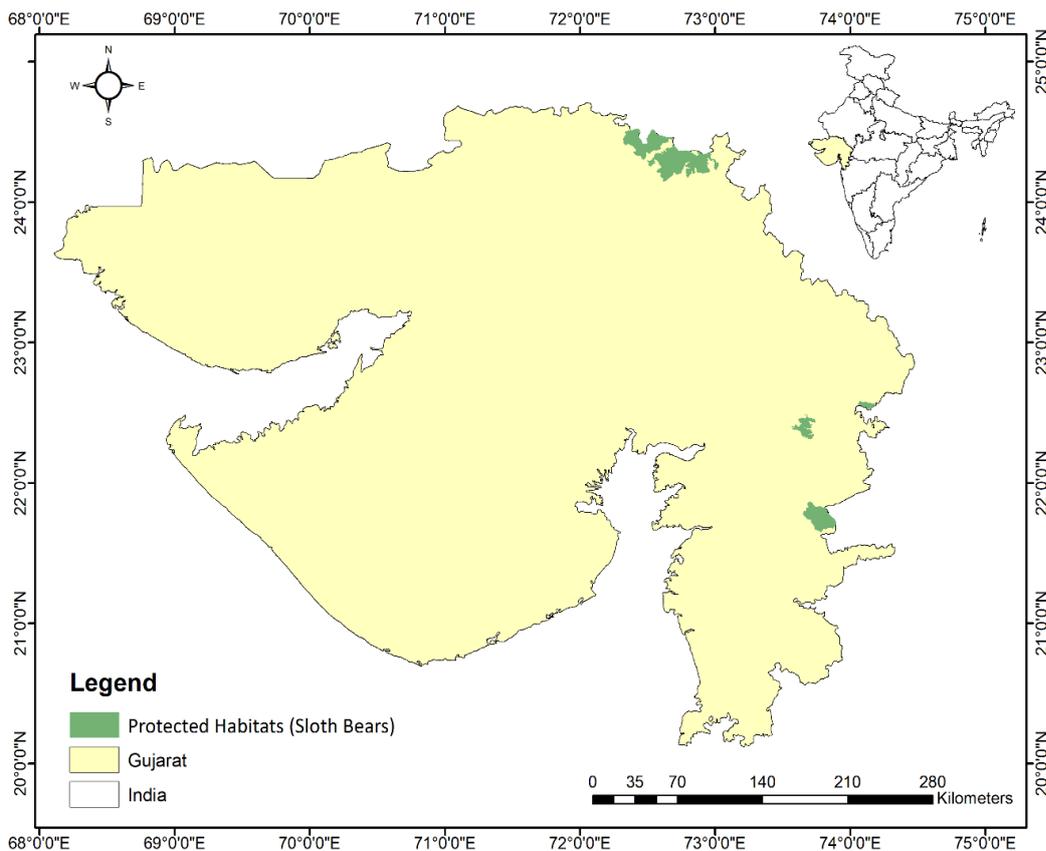


Figure 2.1. Map of Gujarat state (India) with five sloth bear sanctuaries.

2.2 North Gujarat

2.2.1 Jessore Sloth Bear Sanctuary & Balaram Ambaji Sanctuary

Jessore Sloth Bear Sanctuary & Balaram Ambaji Wildlife Sanctuary are located in the Banaskantha district of North Gujarat (Figure 2.2), well known for the presence of sloth bears. The Jessore sanctuary extend along the border between Gujarat and Rajasthan, as part of the southern Aravalli range. It is located between 24°12' to 24.2° N latitude and 72°18' to 72.3° E longitude. The total area of the Sanctuary is around 180 km². Banas and Sipu the main rivers usually flow in monsoon and post monsoon, and almost dry up during the summers (Sukhadiya et al 2013). Balaram Ambaji is located between 24°21'22" to 24.3561°N latitude and 72°38'34" to 72.6427° E longitude. It covers approximate area of 542.08 km² and is the largest Sanctuary in North Gujarat. River Banas and Sabarmati are the major rivers flowing through the Sanctuary.

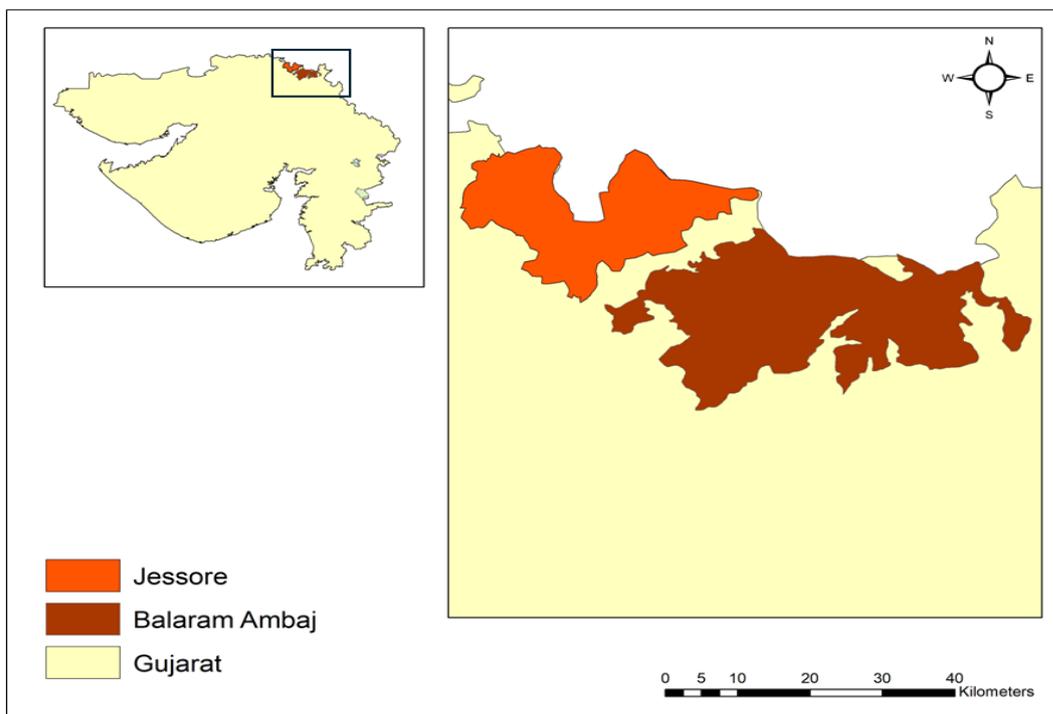


Figure 2.2. Jessore and Balaram Ambaji sloth bear sanctuaries located in North Gujarat.

In the North Gujarat Region, summers are extremely hot. May and June are the hottest months when temperature reaches up to 44°C. Temperature decreases after the onset of monsoon and the winters are mild. January is the coldest month with mean daily minimum temperature around 7°C. Annual rainfall received in Banaskantha district lies between 300 mm to 500 mm (Srivastava et al. 2022).



Image 3. Landscape view of a dam in Jessore Sloth Bear Sanctuary



Image 4. Landscape view of habitat in Balaram Ambaji Wildlife Sanctuary

The forest area in north Gujarat falls under subgroup 5A- Southern Tropical Dry Deciduous Forest and 6B- Northern Tropical Thorn Forest (Champion and Seth, 1968). Further, they can be subdivided into different forest types. The mammals

recorded in northern Gujarat include a total of 27 species from 23 genera and 17 families (Dharaiya & Gajera, 2008). The flagship species is the sloth bear. In addition, it is also known to harbour populations of Indian leopards, striped hyenas, and other wildlife along with various species of birds and reptiles.

2.3 Central Gujarat

2.3.1 Ratanmahal Sloth Bear Sanctuary

The forests of Ratanmahal are in the Limkheda taluka of Dahod district of Central Gujarat. The Sanctuary has an area of approximately 55.65 km² (Figure 2.3). It is situated between 74°37' to 70° 11' East longitude and 22° 32' to 22° 35' North latitude. The forests of Ratanmahal form the catchment of river Panam that originates from the sanctuary area. The summertime temperature here reaches up to 46°C, while December and January can have low temperature of 7°C. Over the entire region, the annual rainfall gradient varies between 800 and 1000 mm (Dharaiya et al. 2021). The forest type is of dry deciduous scrub and southern tropical dry deciduous forest (Champion & Seth, 1968). The Sloth bear is a flagship species, while the other large mammals include Indian leopard, hyena, small Indian civet, four-horned antelope, and langur. The sanctuary also has a rich avian diversity and several species of amphibian and reptiles.

2.3.2 Jambughoda Wildlife Sanctuary (JWLS)

The Jambughoda Wildlife Sanctuary spreads in hilly regions of Halol and Jambughoda talukas in the Panchmahal district, and Sankheda taluka in the Chotta Udepur district, covering an area of approximately 130.38 km² (Figure 2.3). These hills are the southernmost hills of the Aravalli Range, and also form the western extensions of the Vindhya Mountain Range (Gazetteer 1972). The sanctuary is located from 22°22'N to 22°28'N and 73°38'E to 73°44'E. Monsoon in JWLS begins by the end of June and continues till the beginning of October. The temperature of the area rises to a maximum of 46°C during the summers and

falls to 7°C during December & January. The annual rainfall ranges from 800 to 1000 mm (Kumar et al. 2006).

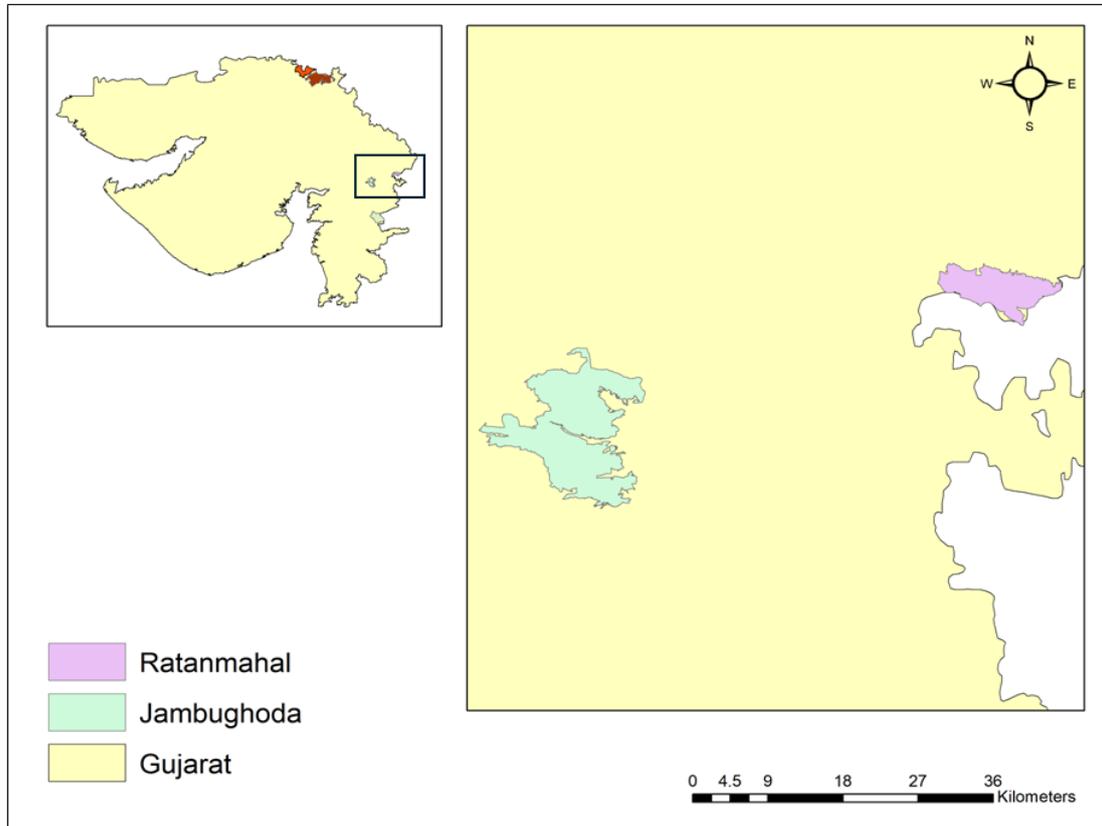


Figure 2.3. Ratanmahal & Jambughoda wildlife sanctuaries located in central Gujarat.

Champion & Seth (1968) classify Jambughoda Wildlife Sanctuary as Southern Tropical dry deciduous forest. Teak (*Tectona grandis*) forest occupies major part of the Sanctuary (Kumar et al. 2006). The flora and fauna of the sanctuary is moderately rich and diversified with a total of 17 mammalian species (Pandya & Oza 1998; Devkar et. al. 2013). These include jungle cat, hyena, barking deer, four horned antelope, and jackal etc. with indian leopard as the major predator. Sloth bear is occasionally reported. Jambughoda has a staggering bird diversity with a wide variety of herpetofauna.

2.4 South Gujarat

2.4.1 Shoolpaneshwar Wildlife Sanctuary

Shoolpaneshwar Wildlife Sanctuary is located on the North-eastern part of Narmada district, in South Gujarat (Figure 2.4). The terrain is mostly hilly, and some hills are known to have elevations between 400m and 864m above mean sea level with moderate to steep slopes, (Gupta & Sharma 2020).

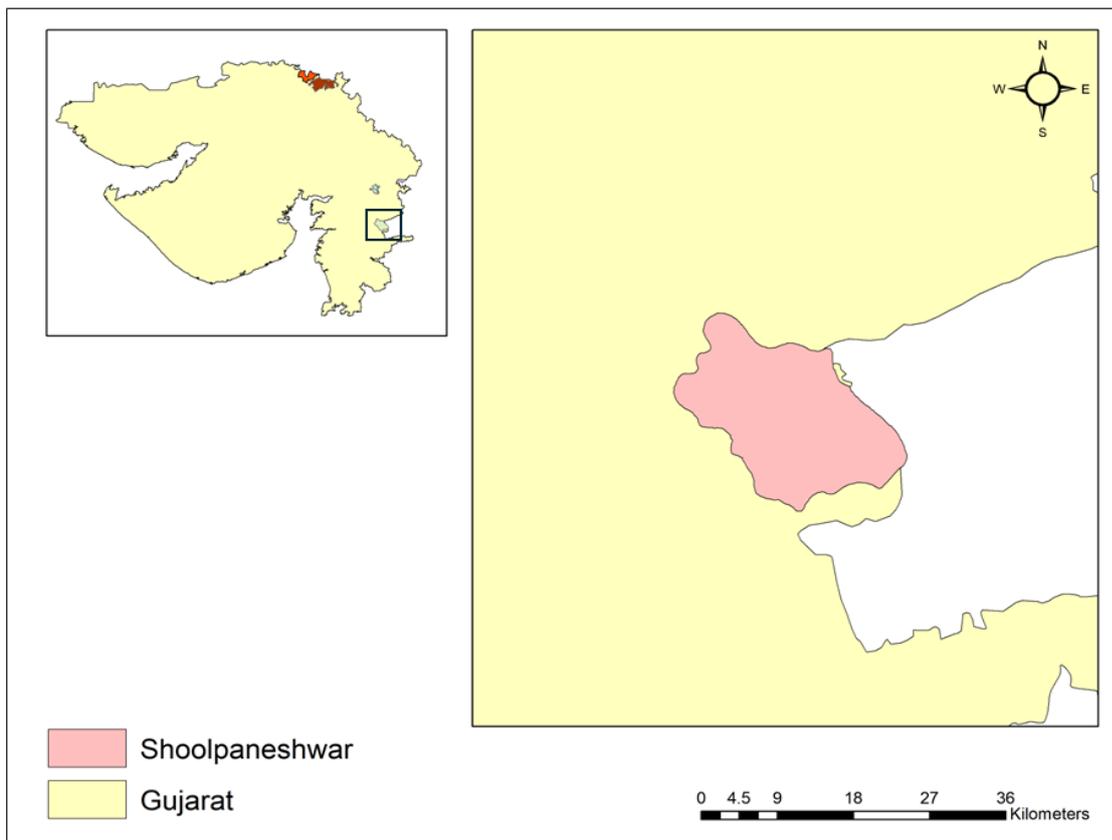


Figure 2.4. Shoolpaneshwar wildlife sanctuary located in south Gujarat.

The sanctuary has an area of about 608km². It is located between 21°03' N to 21°59' N latitude and 73°05' E to 74°10' E longitude. Shoolpaneshwar Wildlife Sanctuary has a tropical climate. In summer, the average maximum temperature is around 43 °C while in winter the average minimum temperature is around 8°C. This sanctuary receives mean rainfall of 1000mm between June to October. Shoolpaneshwar Wildlife Sanctuary constitutes both aquatic and terrestrial

ecosystem components and has a rich diversity of flora and fauna. According to Champion and Seth (1968), the dominant vegetation types in Shoolpaneshwar wildlife sanctuary are Slightly Moist Teak forests (3B/C1b), Southern Moist mixed deciduous forests (3B/C1c), dry deciduous scrubs (5/DS1), dry bamboo brakes (5/ E9), and dry tropical riverine forests (5/1S1) (Kumar and Ramana, 2017). The Shoolpaneshwar Sanctuary is home to 32 species of mammals, several species of reptiles, 198 species of birds, and numerous insects (Gupta & Sharma 2020). Sloth bear, leopards, rhesus macaques, common mongooses, Indian civets, Indian porcupines and four-horned antelope are important fauna here.