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CORRIDORS

2022



## MOUNT ABU-JESSORE CORRIDOR PROFILE



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# Corridor Overview

The Mount Abu-Jessore Corridor connects Mount Abu Wildlife Sanctuary in Rajasthan and Jessore Sloth Bear Sanctuary in Gujarat. This corridor is used by a variety of wildlife including sloth bears (*Melursus ursinus*), leopards (*Panthera pardus*), and striped hyenas (*Hyaena hyaena*). Both Mount Abu and Jessore Wildlife Sanctuaries have high densities of sloth bears, making the corridor important for sloth bear movement.



Area of natural habitat  
Medium  
31.41%



Area under forest department  
Medium  
46.49%



Threatened species richness  
Low  
28 species/km<sup>2</sup>



Average human population  
Medium  
173 persons/km<sup>2</sup>



Human modification index  
Medium  
0.57



Natural habitat fragmentation index  
Medium  
0.78



Landscape complexity index  
Medium  
0.89



Land use change index  
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Habitat connected: **Mount Abu-Jessore**

Area of corridor: **31 km<sup>2</sup>**

Focal species: **Sloth bear**

Major threats: **Linear infrastructure**

CWC members: **WCB Research Foundation**



# 1 Corridor Significance

## 1.1 Importance of core habitats connected

### Mount Abu Wildlife Sanctuary:

Mount Abu is the only hill station in the state of Rajasthan, and is a major tourist destination. Mount Abu Wildlife Sanctuary is situated in the Sirohi district of Rajasthan and was declared a wildlife sanctuary in 1960. It has a total area of 288 km<sup>2</sup>, with an elevation ranging between 300 m to 1,722 m above sea level. Mount Abu has a unique diversity of habitats owing to its variation in altitude. This ecoregion is home to several mammal species such as the sloth bear (IUCN Red List: Vulnerable), leopard (IUCN Red List: Vulnerable), jungle cat (*Felis c. *haus**) and striped hyena (IUCN Red List: Near Threatened). Mount Abu Wildlife Sanctuary boasts over 146 species of birds (Sangha and Devarshi, 2006).

### Jessore Sloth Bear Sanctuary:

Jessore is located in the southern part of the Aravalli range in the Banaskantha district of Gujarat. It has an area of 180 km<sup>2</sup> and is covered by dry deciduous forests. At 1,067 m above sea level, Mount Jessore is the second highest peak in Gujarat and is known for the temple of Kedarnath. It has been reported to support one of the highest sloth





bear densities in India (Sukhadiya et al., 2013). The vegetation in this sanctuary includes mixed dry deciduous forests and open woodland on hills, and degraded deciduous-scrub dominated by *Prosopis juliflora*, thorn forest, and thorn-scrub in the plains (Singh, 2001; Trivedi, 2009).

## 1.2 Wildlife utilising the corridor

Sloth bears have been reported from the Chotila beat of the Sirohi territorial forest division that lies within the Mount Abu-Jessore corridor (Thatte et al., In prep). Apart from sloth bears, other large mammals, resident in Jessore and Mount Abu sanctuaries, such as leopards, hyenas, ratel (*Mellivora capensis*), pangolin (*Manis crassicaudata*), four-horned antelope (*Tetracerus quadricornis*), and python (*Python molurus*) also likely use this corridor as habitat and for movement (Gajera and Dharaiya, 2011; Dharaiya, 2017).

White-rumped vulture (*Gyps bengalensis*), Indian vulture (*Gyps indicus*) and Red-headed vulture (*Sarcogyps calvus*) are critically endangered bird species likely to be found in the corridor area. Also, endangered migrant species such as Steppe eagle (*Aquila nipalensis*) and Egyptian vulture (*Neophron percnopterus*) are also likely found here.

## 1.3 Importance for landscape-scale connectivity

Both Mount Abu and Jessore support high-density sloth bear populations in the southern Aravallis landscape, which forms the western limit of the sloth bear's range. Mount Abu is connected towards the north to the Kumbhalgarh Wildlife Sanctuary and towards the east to Phulwari ki Nal Wildlife Sanctuary through the Sirohi and Udaipur Territorial Forest Divisions, respectively. Jessore is connected to Balaram-Ambaji Wildlife Sanctuary towards the east. Sloth bear populations in these protected areas are not genetically differentiated (Thatte et al., In prep). This indicates that the presence or movement of sloth bears beyond protected areas in the southern Aravallis landscape likely helps to maintain genetic connectivity between populations (Thatte et al., In prep)



Striped Hyena  
(*Hyaena hyaena*)

## 2 Corridor Characteristics

### 2.1 Boundaries

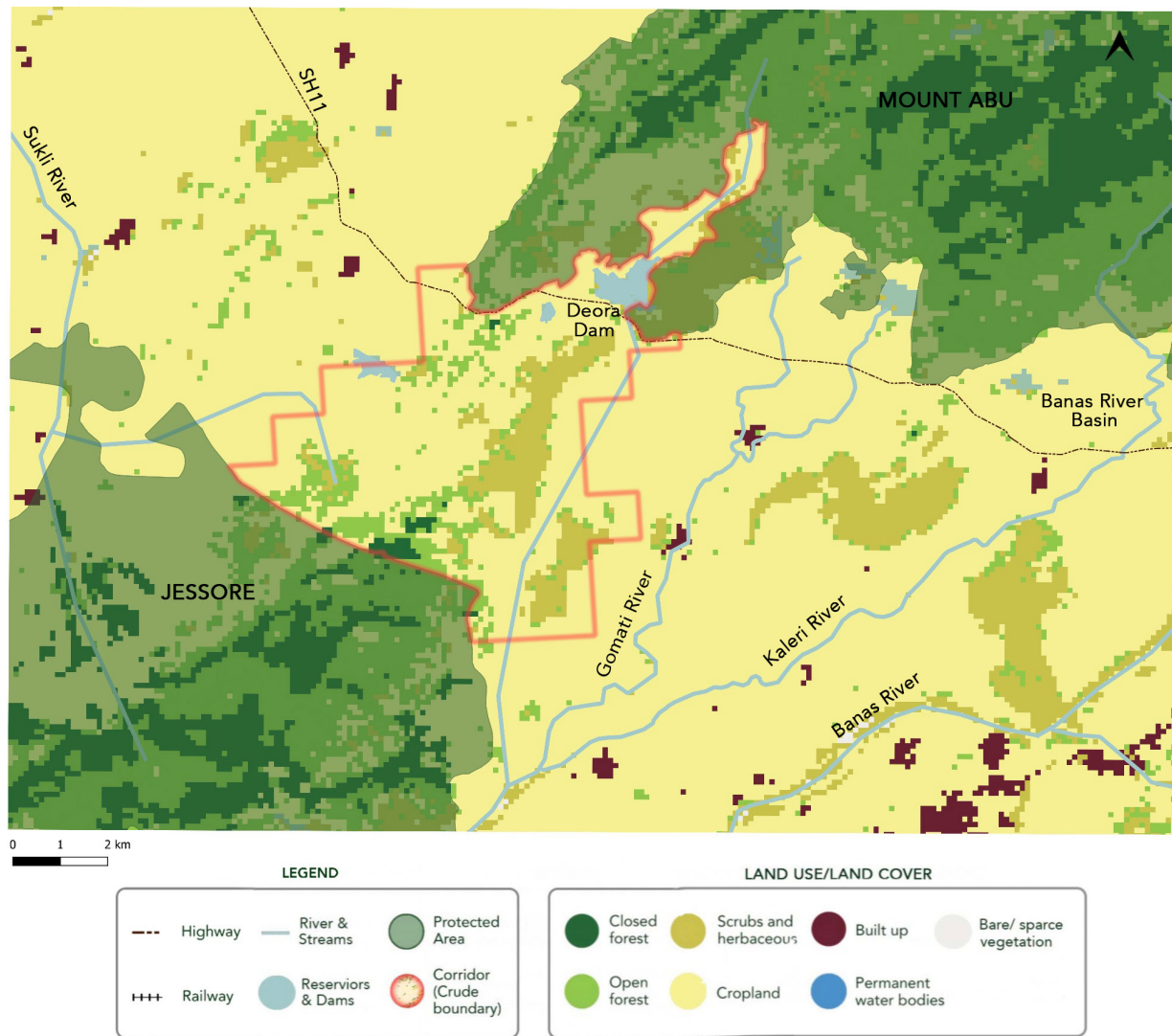


Figure 1: Map showing a crude boundary of the corridor between Mount Abu Wildlife Sanctuary in Rajasthan and Jessore Sloth Bear Sanctuary in Gujarat\*, along with river and road network.

(\*The indicators and the quantitative description in the corridor profile have been calculated using a crude corridor boundary. The crude corridor boundary was delineated by overlaying a 1 km<sup>2</sup> grid on the land-use land cover map. Due to a lack of functional connectivity data, the potential corridor grids

were selected based on the structural landscape connectivity and the Eco-Sensitive Zone boundary, reviewed by an expert and then dissolved to get the crude boundary. The selected grids were not restricted to only forested areas but also included the surrounding agriculture-village matrix as sloth bears



areas but also included the surrounding agriculture-village matrix as sloth bears are known to use agricultural areas.)

Most of the ~40 km<sup>2</sup> corridor is spread across the Abu road and Reodar tehsils (a local unit of an administrative division) of Sirohi district in Rajasthan, and a minor part (~3 km<sup>2</sup>) falls under the Amirgarh tehsil of Banaskantha district in Gujarat. Chotila and Muliya Magri beats of the Sirohi forest division fall within the corridor. Most of the corridor area in Rajasthan comes under the eco-sensitive zone (ESZ) around Mount Abu Wildlife Sanctuary, that includes the two forest beats and the surrounding farmlands.

## 2.2 Physical characteristics

Both Mount Abu Wildlife Sanctuary and Jessore Sloth Bear Sanctuary have dry deciduous vegetation and are connected by a spine of small hills surrounded by reserve forests, agricultural fields, streams, and rivers. The corridor falls within the West Banas river basin.

## 2.3 Hydrology

There are several small streams that originate within the corridor which is one of the several headwater regions of the larger West Banas river catchment that flows westwards from Rajasthan into Gujarat. The stream that runs through the western portion of the corridor flows from south to north and contributes water to a minor dam located near Paleri Khera village. There are three water

resource infrastructures constructed within the corridor boundary which is fed by small streams in the region. Deora Dam is one of the main water resources located within the corridor in headwater of the catchment. The water spread area in the reservoir is 24 ha. The average annual rainfall in the region is 742 mm and the region falls in severe drought-prone areas (Sharma and Goyal, 2018). The forest cover in the region, a catchment of the West Banas river, is likely to be critical for hydrological functions of the river as forests help groundwater recharge and contribute to base flows in the rivers/streams during lean season (Zhang et al., 2017).

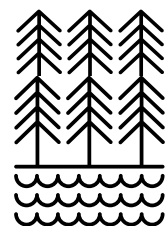
## 2.4 Land use within corridor



~ 68%  
of the corridor is  
agricultural land

~ 30%

of the corridor is  
forest land (classified  
as open forest and  
scrub)



Smaller tributaries of the  
West Banas river and  
streams flow through the  
corridor, some of which  
have small dams.

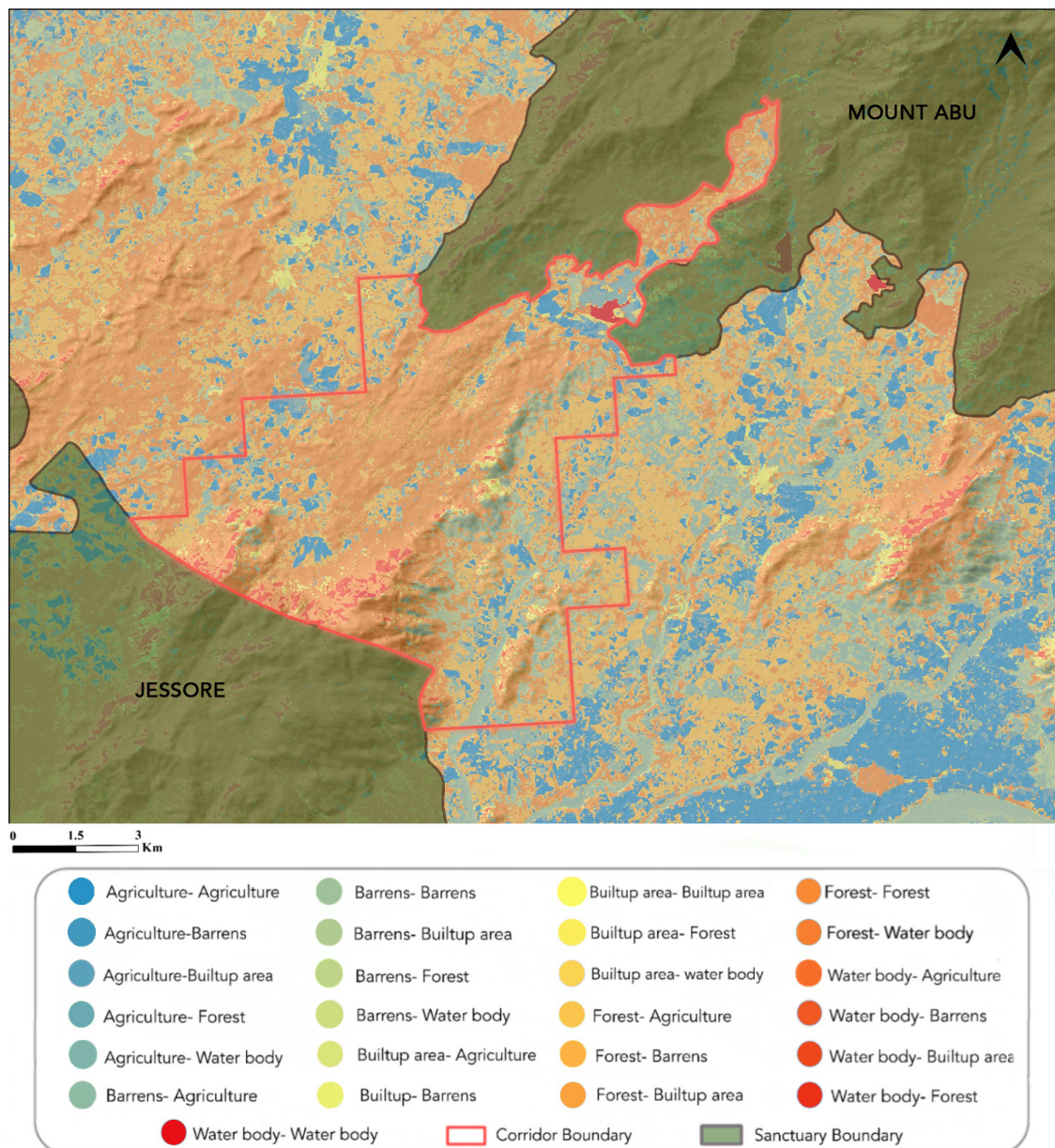


Figure 2: Change in land use and land cover (LULC) over the last 30 years in the Mount Abu-Jessore corridor estimated using 10m resolution Sentinel II data from IRS ISRO (Source: Vyas, 2020)

Over the last three decades, the rate of land-use within the corridor has changed substantially (Table 1). Area under agriculture has increased, largely owing to conversion of barren land and forests into crop fields (Vyas, 2020). Figure 2 represents land use change within the corridor.

Indian leopard  
(*Panthera pardus fusca*)



Table 1: LULC change in km<sup>2</sup> over last 30 years in the Mount Abu-Jessore Corridor (Source: Vyas, 2020)

LULC class	1990-2000	2000-2010	2010-2020
<b>Water body</b>	+2	No change	No change
<b>Barren Land</b>	-35	+15	-40
<b>Agriculture</b>	+25	-6	+73
<b>Settlement</b>	-4	-8	No change
<b>Forest</b>	+12	-1	-33



The landscape of Mount Abu-Jessore Corridor is dotted with small hills that are surrounded by reserve forests and agricultural fields



## 3 Stakeholders and Management

### 3.1 Land tenure, land holding and legal status

The corridor is part of the ESZ notified around the Mount Abu Wildlife Sanctuary by the Rajasthan Forest Department and Government of India. At its longest breadth of 6.08 km, the ESZ covers a major part of the corridor area between the two sanctuaries (Figure 4). Table 2 (below) lists the activities regulated and prohibited in the ESZ. 56% of the area of the corridor is under the jurisdiction of the forest department and is a part of the Sirohi territorial forest division.

### 3.2 Settlements and Communities

The average human population density in the corridor is 173 people/km<sup>2</sup>. Garasiya is the dominant tribal community in the Abu road sub-district which covers ~50% of the corridor area (Jaroli et al., 2010). Traditionally a nomadic community, their primary source of income in the region is agriculture and animal husbandry (Jaroli et al., 2010).



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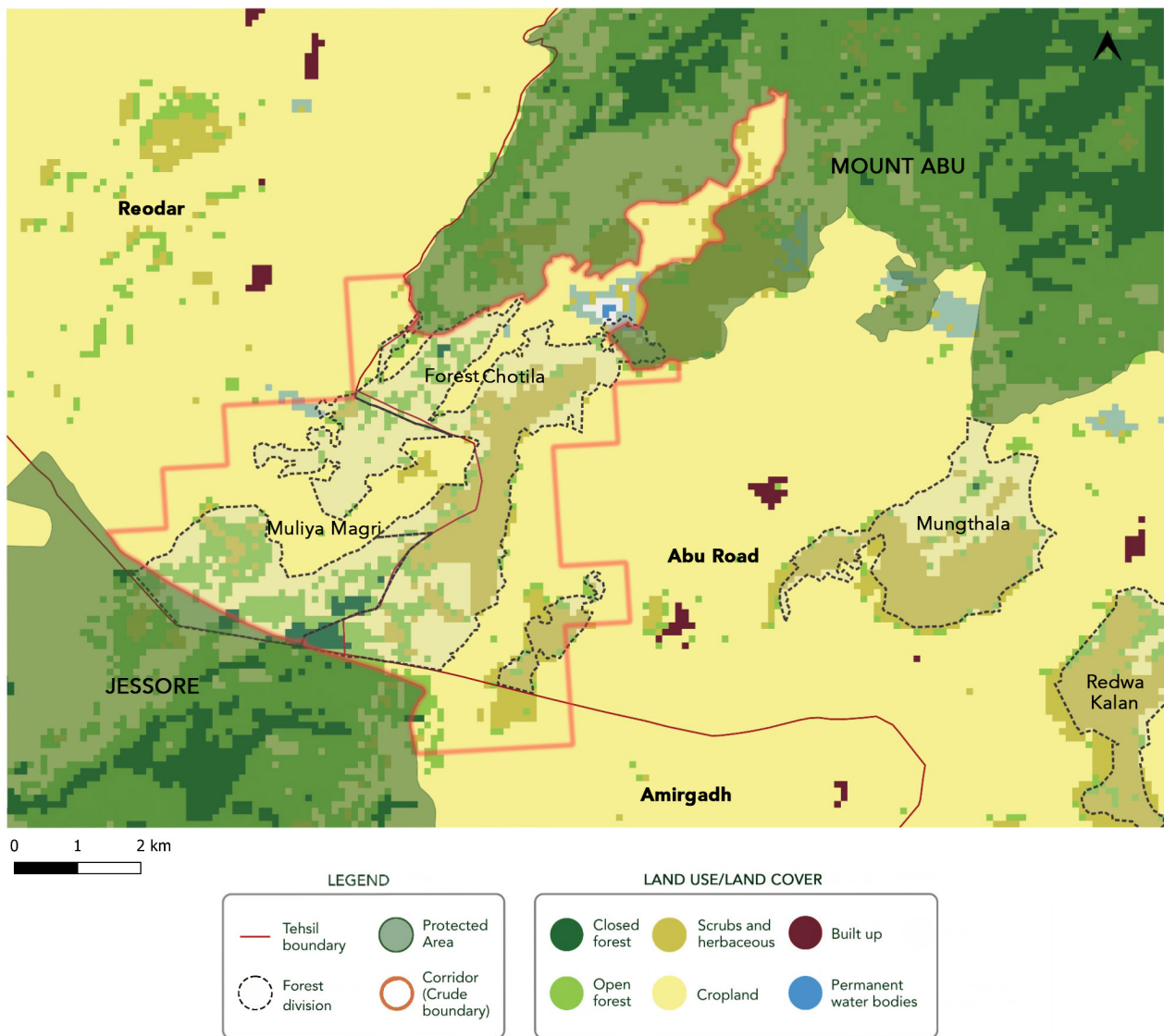


Figure 3: Map showing tehsil boundaries (Reodar, Abu road and Amirgadh) and the beats of the Sirahi territorial forest division that fall within the Mount Abu-Jessore corridor.



The Mount Abu-Jessore Corridor has a high density of sloth bears.



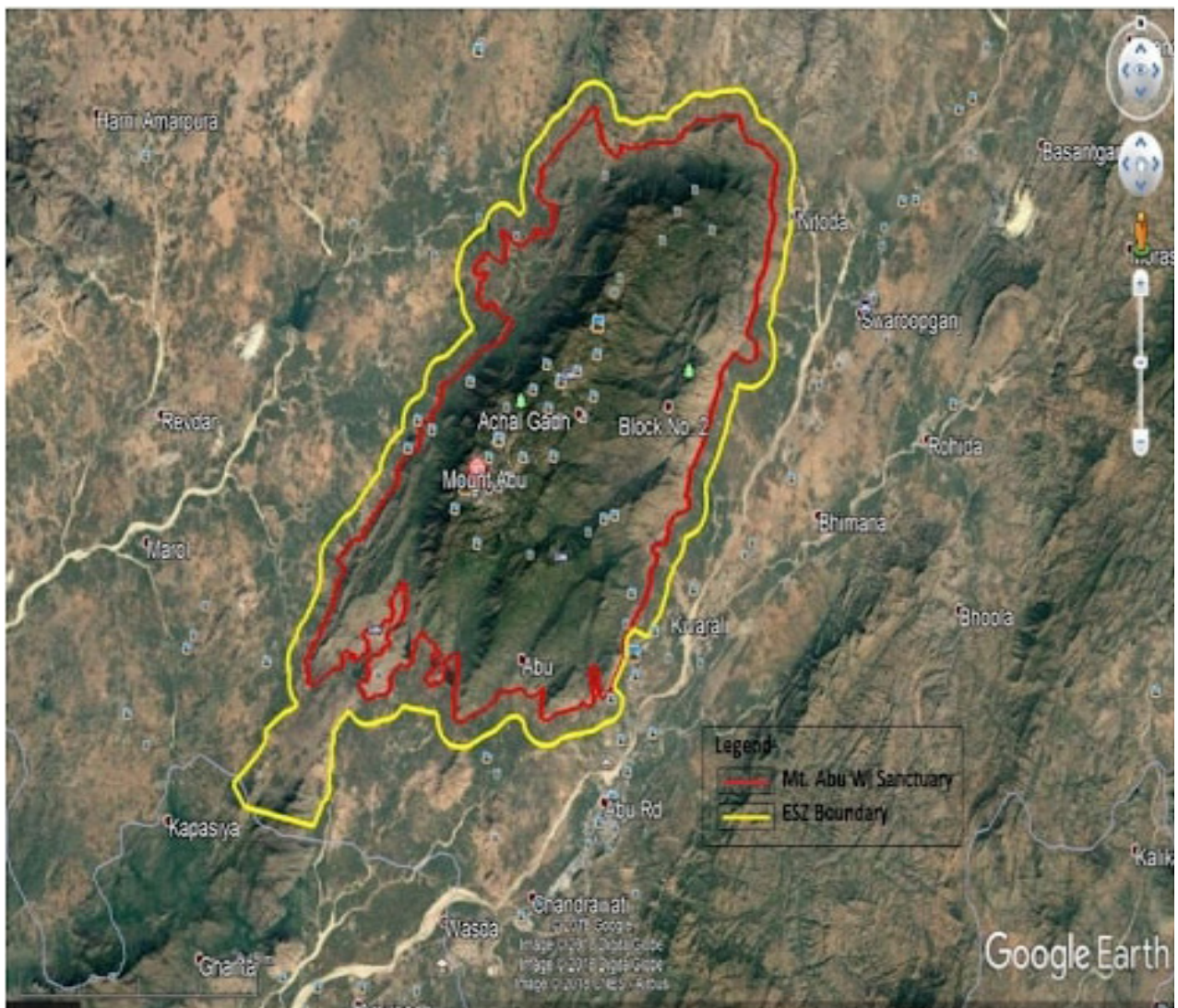


Figure 4: Eco Sensitive Zone (ESZ; in yellow) around Mount Abu Wildlife Sanctuary (Map from Ministry of Environment, Forest, and Climate Change notification, November 2020)



Jungle cat  
(*Felis chaus*)



Table 2: List of regulated and prohibited activities in the corridor area falling within the ESZ (Source: Ministry of Environment, Forest, and Climate Change notification, November 2020)

	Regulated activities	Prohibited activities
<b>Commercial</b>	Construction of commercial hotels, petrol pumps, or small-scale non-polluting industries; commercial extraction of groundwater.	Commercial mining and quarrying; construction of new industries; setting up of sawmills, brick kilns, and wood-based industries; commercial use of firewood; expansion of existing polluting industries.
<b>Infrastructure</b>	Construction activities; setting up of civic amenities infrastructure (including electrical and communication towers); upgradation of existing roads.	Establishment of major hydro-electric projects.
<b>Agriculture</b>	Ongoing agriculture and horticulture practices; establishment of large-scale commercial livestock and poultry farms; introduction of exotic species.	Fishing.
<b>Other activities</b>	Collection of non-timber forest produce; movement of vehicular traffic in night; use of polythene; fencing.	Discharge of untreated effluents; use of high-intensity and bright lights.

## 4 Challenges

### 4.1 Infrastructure

Although only a 6 km stretch of a state highway (SH 11) passes through this corridor (Figure 1), there are several small roads crisscrossing through the landscape. Roadkills have been reported on these smaller roads.

### 4.2 Human-Wildlife conflict

Data exclusively from the corridor area is not available. However, data from surrounding areas in the Southern Aravallis landscape suggests that human-sloth bear conflict likely exists

in this region. In North Gujarat, habitat fragmentation is considered to be one of the reasons for increased human-sloth bear conflict (Dharaiya, 2009). Human-sloth bear conflict is particularly dangerous because sloth bears are known to be aggressive and unpredictable. Most sloth bear attacks outside of protected areas are found to be driven by underlying causes such as the degradation of sloth bear habitat, limited natural food resources, and the potential availability of anthropogenic food near villages (Dharaiya, 2009). More studies within this corridor are required to better understand the patterns of such conflict.



A jackal (*Canis aureus*) roadkill on one of the smaller roads close to Mount Abu Wildlife Sanctuary.



### 4.3 Land use change

Over the last few decades, forests have been converted to other land uses within the corridor and along the edge of the Mount Abu Wildlife Sanctuary (data presented in section 2.4). The remaining forests need to be protected from further loss to ensure structural within the corridor is not lost.

This is essential, as sloth bears, one of the focal species using the corridor, have strong habitat associations (Ramesh et al., 2012; Das et al., 2014; Puri et al., 2015), and are hence likely to be impacted by further loss and fragmentation of the forest.



Forest fragmentation is one of the potential reasons for increased human-sloth bear interaction in the regions surrounding the corridor.



## 5 Recommendations

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1. The last few decades have witnessed a conversion of forests into other land uses within the corridor. Efforts need to be taken to prevent future land use change to ensure structural connectivity within the corridor is not lost. This would not only be important for the wildlife using the corridor but also for the hydrological functions of the streams flowing through the corridor.
2. Overall, there is a dearth of information on this corridor. Future surveys need to be carried out in order to evaluate the habitat quality and understand the challenges and status of the corridor. This information will help draft recommendations and management plan that are specific to the corridor.





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## 7 Supplementary Information

Seven principal indicators, namely area of natural habitat, area under forest department, threatened species richness, average human population, human modification index, landscape complexity index, and natural habitat

fragmentation index, were calculated to provide the overall status of the corridor. The criteria of estimating the value of each indicator is available online at <http://corridorcoalition.org/CWC/about.html>



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