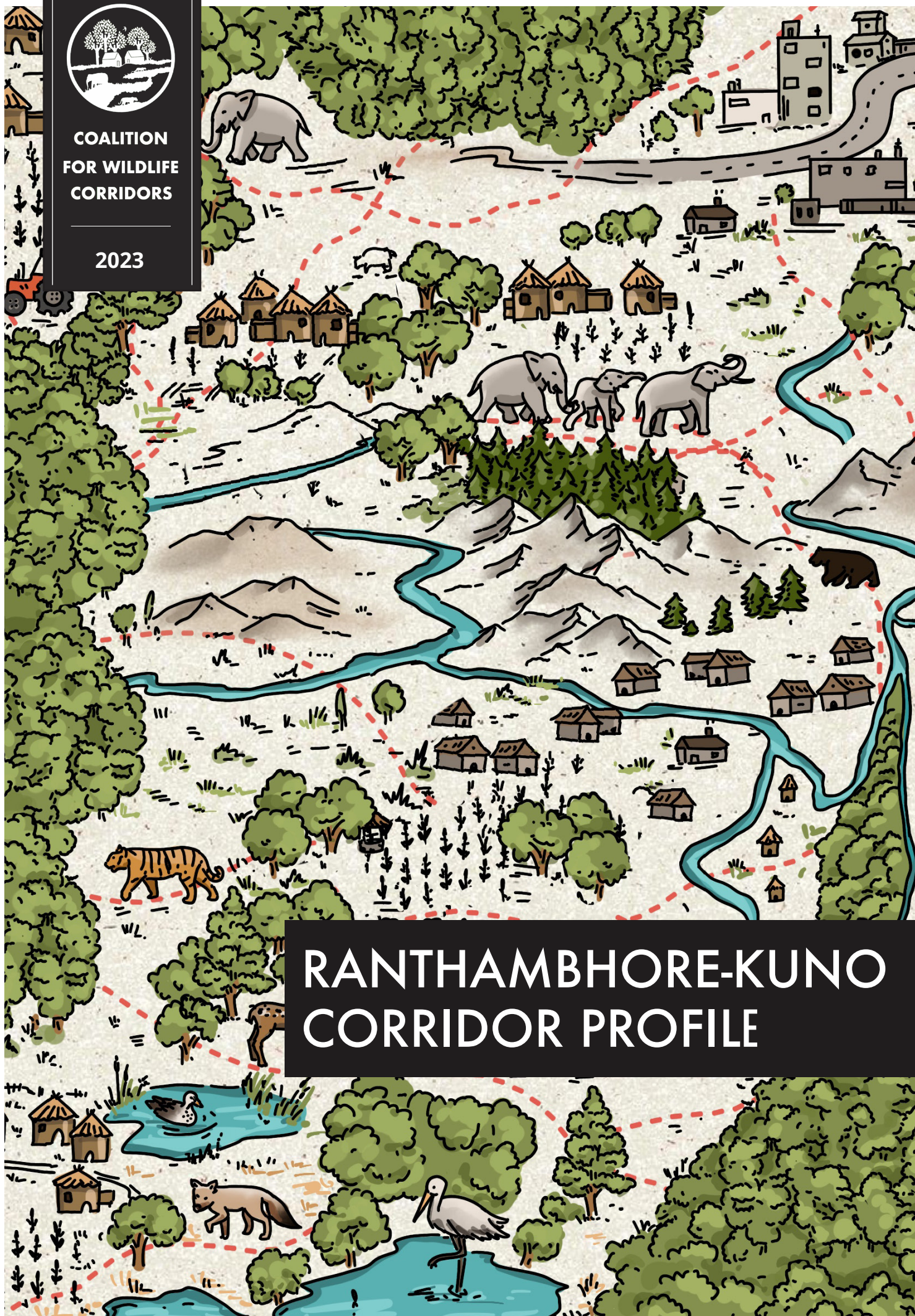




COALITION  
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CORRIDORS

2023

# RANTHAMBHORE-KUNO CORRIDOR PROFILE





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# Corridor Overview

The Ranthambhore-Kuno Corridor connects Ranthambhore Tiger Reserve (RTR) in Rajasthan and Kuno National Park (KNP) in Madhya Pradesh. The corridor is a mosaic of agricultural fields, villages, forest patches, and ravines. RTR and adjoining protected areas collectively support a significant tiger population and mark the western-most extent of their distribution in India. Situated to the east of RTR, KNP currently lacks a stable tiger population. However, its vast area, abundant herbivore populations, and historical evidence of tiger presence make it a potential tiger habitat. Efforts to conserve this corridor are critical as the RTR tiger population is currently isolated; moreover, KNP is structurally connected, although tenuously, to the

larger and more genetically diverse tiger population in central India. In addition to its significance for tigers, the corridor plays a crucial role in conserving various other mammal species, including caracals, Indian grey wolves, striped hyenas, leopards, and pangolins. Further, smooth-coated otters and gharials are found in the stretch of the National Chambal Sanctuary that traverses this corridor. The primary threat to this corridor is land use change, particularly the flattening of ravines that serve as vital wildlife habitats along the Chambal river. As this corridor is spread across Rajasthan and Madhya Pradesh, collaborative efforts between these states are essential for its effective management and conservation.



**Habitat amount**  
Medium  
45 %



**Area under forest department**  
Medium  
40 %



**Threatened species richness**  
Medium  
35 species/km<sup>2</sup>



**Human population**  
Medium  
188 persons/km<sup>2</sup>



**Human modification index**  
Medium  
0.46



**Fragmentation index**  
Low  
0.83



**Landscape complexity**  
Medium  
0.83



**Land use change index**  
Low  
0.83

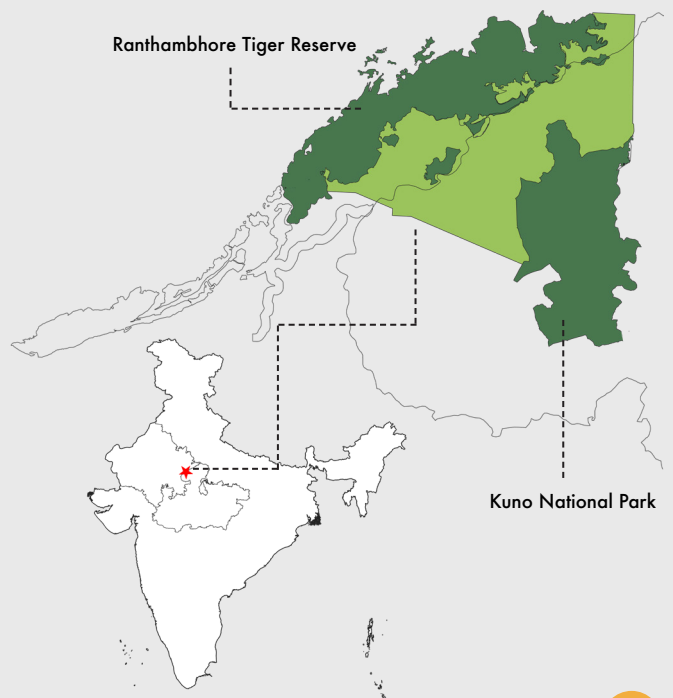
**Habitat connected:** Ranthambhore Tiger Reserve and Kuno National Park

**Area of corridor:** 2500 km<sup>2</sup>

**Focal species:** Tiger, Leopard, Hyena, Caracal, Wolf

**Major threats:** Linear infrastructure, sand and stone mining, land-use change

**Coalition for Wildlife Corridors member(s):** WWF-India



★ Ranthambhore-Kuno corridor

# 1 Corridor History

Historical records bear witness to the thriving wildlife in the princely states of Gwalior, Karauli, and Jaipur, where the present-day Kuno National Park and Ranthambhore Tiger Reserve (RTR) are located. The region between RTR and the Chambal River was the preferred tiger hunting ground of the royal families of Jaipur and Karauli and the visiting Europeans during the late 19th and early 20th centuries (Singh and Reddy, 2016). On the other side of the Chambal river, Maharaja Madhavrao Scindia of Gwalior favored wildlife preservation over hunting to achieve game-book records, “a thing he very well could have done so far as tigers were concerned,” Colonel Kesri Singh writes in his book “One Man and a Thousand Tigers,” since some of his

jungles were literally infested with them. Therefore, during his regime (1925–61), tigers increased, and were also seen crossing the Chambal river towards RTR (Singh and Reddy, 2016). Apart from tigers, this region was renowned for its high density of leopards, sambars, blackbucks, chinkaras, and wild pigs. Indiscriminate hunting, loss of grasslands and low priority to forest protection and land-use change resulted in severe decline of wildlife in the region in the early second half of the 20th century. Currently, forest-dependent species are largely restricted to protected areas (PAs), and maintaining connectivity between PAs is vital for their long term survival.





## 2 Corridor Significance

### 2.1 Importance of core habitats connected

#### **Ranthambhore Tiger Reserve (RTR) :**

Located in the state of Rajasthan, this tiger reserve spans over an area of 1473 km<sup>2</sup> and supports a population of 59 adult tigers (Qureshi et al. 2023). Of the total area, 1113 km<sup>2</sup> have been notified as the core area, which includes Ranthambhore National Park (282 km<sup>2</sup>), Sawai Madhopur Wildlife Sanctuary (WLS) (131 km<sup>2</sup>), Sawai Mansingh WLS (113 km<sup>2</sup>), parts of Kailadevi WLS (402 km<sup>2</sup>) and Kuwal Ji Reserve Forest (185 km<sup>2</sup>). The remaining 360 km<sup>2</sup> of RTR serves as a buffer area (Tiger Conservation Plan of Ranthambhore Tiger Reserve 2013–2023, TCP-RTR). The Banas River, a tributary of the Chambal river, flows through the tiger reserve and separates Ranthambhore National Park from Kailadevi WLS. RTR is home to 38 species of mammals, including the locally endangered caracal, 315 species of birds, 14 species of reptiles, 7 species of amphibians, 9 species of fish, 27 species of butterflies, and 18 species of spiders (TCP-RTR; Rahmani et al. 2016). RTR has a high-density tiger population and, along with its adjoining PAs, forms the western-most tiger conservation unit in the country (Shah et al. 2015). However, tigers in Ranthambhore are isolated, and as a result, twice as inbred as other tigers in India (Khan et al. 2021).

#### **Kuno National Park (KNP) :**

Located in the Sheopur district of Madhya Pradesh, KNP (748.762 km<sup>2</sup>) and its adjoining buffer area fall within the Kuno Wildlife Division, which covers a total area of 1235 km<sup>2</sup>. KNP forms a part of the larger Sheopur-Shivpuri dry deciduous open forest landscape, spanning an area of approximately 6,800 km<sup>2</sup>. Kuno River, one of the major tributaries of the Chambal, flows along the entire length of KNP and bisects the National Park (Soni, 2021). KNP is home to 33 species of mammals, 206 species of birds, 14 species of fish, 33 species of reptiles, and 10 species of amphibians (Chaudhari, 2001).

KNP was one of the proposed PAs to reintroduce the only extinct large carnivore in the country, the cheetah (*Acinonyx jubatus*), and in September 2022, eight individuals were translocated from Namibia to KNP. KNP, which was within the historical range of the cheetah, was selected as the first site for re-introduction as it has the required level of protection, prey density, and habitat. Additionally, in the past decade, substantial investment in habitat restoration was made in KNP for a proposed Asiatic lion reintroduction project (Jhala et al. 2021).



Gharial  
(*Gavialis gangeticus*)

## 2.2 Wildlife utilising the corridor

Population genetic research and camera-trapping studies provide evidence of tiger movement between RTR, KNP, and Madhav National Park (Reddy et al. 2012; The Times of India, 2020). In addition to tigers (*Panthera tigris*), the corridor area harbors a diverse carnivore guild. This includes five felids - leopard (*Panthera pardus*), caracal (*Caracal caracal*), jungle cat (*Felis chaus*), rusty spotted cat (*Prionailurus rubiginosus*) and the Asiatic wildcat (*Felis lybica ornata*); three canids - gray wolf (*Canis lupus*), golden jackal (*Canis aureus*) and the Indian fox (*Vulpes bengalensis*); five viverrids - Indian grey mongoose (*Herpestes edwardsii*), ruddy mongoose (*Herpestes smithii*), small Indian mongoose (*Herpestes auropunctatus*) Asian palm civet (*Paradoxurus hermaphroditus*) and the small Indian civet (*Viverricula indica*); two mustelids, the ratel (*Mellivora capensis*) and smooth-coated otter (*Lutrogale perspicillata*), along with sloth bear (*Melursus ursinus*) and the striped hyena (*Hyaena hyaena*) (WWF unpublished data, 2022; Kannan et al. 2022; Taigor and Rao, 2010). Kannan et al. (2022) studied the habitat use of four large carnivores in this corridor (hyena, leopard, tiger, and sloth bear) and found that while sloth bear and tiger habitat use is largely restricted around Ranthambhore National

Park, leopards and hyenas use areas across this multi-use corridor.

Wild ungulates such as chital (*Axis axis*), sambar (*Rusa unicolor*), nilgai (*Boselaphus tragocamelus*), wild pig (*Sus scrofa*), chinkara (*Gazella bennettii*), chousingha or four-horned antelope (*Tetracerus quadricornis*), and blackbuck (*Antelope cervicapra*) as well as primates such as gray langur (*Semnopithecus entellus*) and rhesus macaque (*Macaca mulata*) are also found in the corridor area. The Indian crested porcupine (*Hystrix indica*), Indian hare (*Lepus nigricollis*), and the endangered and highly persecuted Indian pangolin (*Manis crassicaudata*) are other notable mammals found in this landscape (WWF unpublished data, 2022; Kannan et al. 2022; Ranganathan, 2017).

Six species of vultures have been reported in the corridor: the Egyptian vulture (*Neophron percnopterus*), the red-headed vulture (*Sarcogyps calvus*), the long-billed vulture (*Gyps indicus*), the white-rumped vulture or Indian white-backed vulture (*Gyps bengalensis*), the griffon vulture (*Gyps fulvus*), and the cinereous vulture (*Aegypius monachus*) (Singh et al. 2022).





## 2.3 Recognized biodiversity conservation sites in the corridor

A 572 km stretch of the Chambal river is protected as the National Chambal WLS. Notified in 1979, it is a tri-state riverine sanctuary (Rao et al. 2016) and has also been identified as an Important Bird and Biodiversity Area (IBA code: IN RJ-11). About 97 km of the sanctuary lie in the Ranthambhore-Kuno Corridor and is home to the critically endangered gharial (*Gavialis gangeticus*). It also harbors the critically endangered red crowned roofed turtle (*Batagur kachuga*) along with 6 other species of terrapins: Indian softshell turtle (*Nilssonia*

*gangetica*), Indian flapshell turtle (*Lissemys punctata*), Indian narrow-headed softshell turtle (*Chitra indica*), three-striped roofed turtle (*Batagur dhongoka*), Indian tent turtle (*Pangshura tentoria*) and the brahminy river turtle or crowned river turtle (*Hardella thurjii*) (Taigor et al. 2010). It also supports a diverse list of birds including the endangered Indian skimmer (*Rynchops albicollis*) and the black bellied tern (*Sterna acuticauda*) and the tallest flying bird, the sarus crane (*Grus antigone*) (Nair et al. 2013; Singh et al. 2022).

## 2.4 Importance of landscape-scale connectivity

RTR is currently the sole source population of tigers among the fragmented habitats in north-western India (Qureshi et al. 2014). Recently, Khan et al. (2022) reported that this isolated population exhibits a considerable degree of inbreeding, or the mating of closely related individuals. Inbreeding decreases the genetic diversity of a population, which could result in the accumulation of dangerous mutations and reduced immunity and survival. In the future, depauperate genetic variation and a high mutation load (of potentially bad or damaging variants) could hamper the ability of these tigers to adapt to changing environments, jeopardizing their long-term survival. This highlights the importance of conserving connected networks of PAs that can facilitate the dispersal of individuals and genetic exchange (Sadhu et al. 2017; Vasudev et al. 2017).

Over the last two decades, there have been several records of tigers having dispersed from RTR to the surrounding PAs, including KNP (and onwards to Madhav National Park) in the east, Ramgarh Vishdhari Tiger Reserve and Mukundara Hills Tiger Reserve in the south, and Ramsagar, Van Vihar, Kesarbagh, and Bandh Baretha wildlife sanctuaries towards the north (Reddy et al., 2012; Borah et al., 2015). All these PAs, except RTR, are currently sink habitats and do not support stable tiger populations, but the region holds potential for future increases in tiger occupancy and numbers owing to the large

Smooth-coated otter  
(*Lutrogale perspicillata*)



size of the landscape with suitable habitat (Qureshi et al. 2014). Strengthening connectivity around RTR would be a critical component of tiger recovery in the landscape. Further towards the south-east, KNP and Madhav National Park have potential connectivity with Panna Tiger Reserve through fragmented forests. This patchy connectivity is a potential link to the central India landscape that hosts a large and genetically diverse tiger population (Jhala et al. 2021).

# 3 Corridor Characteristics

## 3.1 Boundaries

Spanning an area of approximately 2500 km<sup>2</sup>, the Ranthambhore-Kuno Corridor spreads across the districts of Sawai Madhopur (19% of the corridor area) and Karauli (10%) in Rajasthan, Sheopur (62%), and Morena (9%) in Madhya Pradesh (Figure 2).

Administratively, the forested parts of the corridor fall under the jurisdiction of four territorial forest divisions: Karauli, Sheopur, Morena, and Kuno (Figure 3).

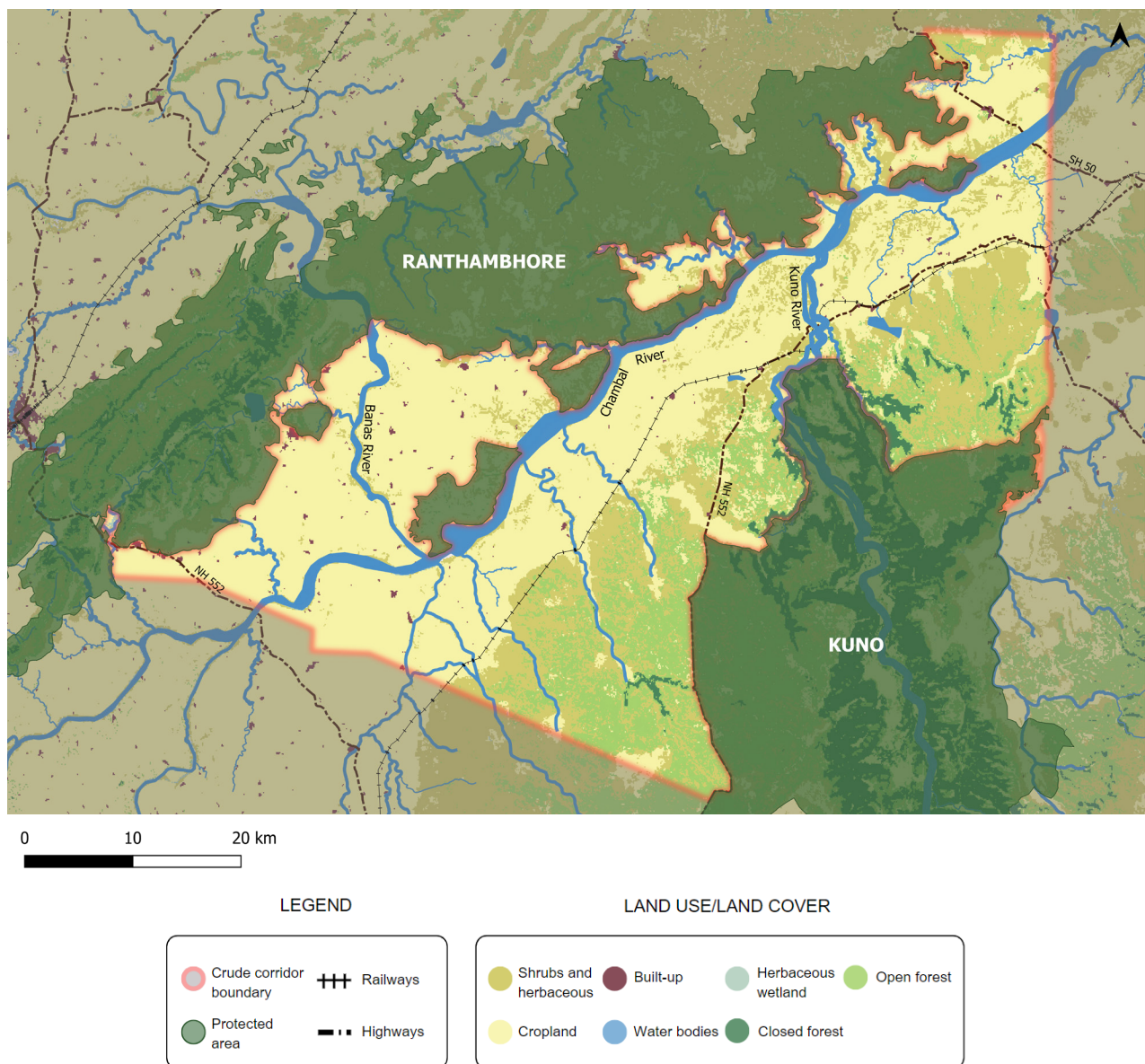


Figure 1. Ranthambhore-Kuno Corridor delineated using a crude boundary (delineation details are provided in Supplementary Information).



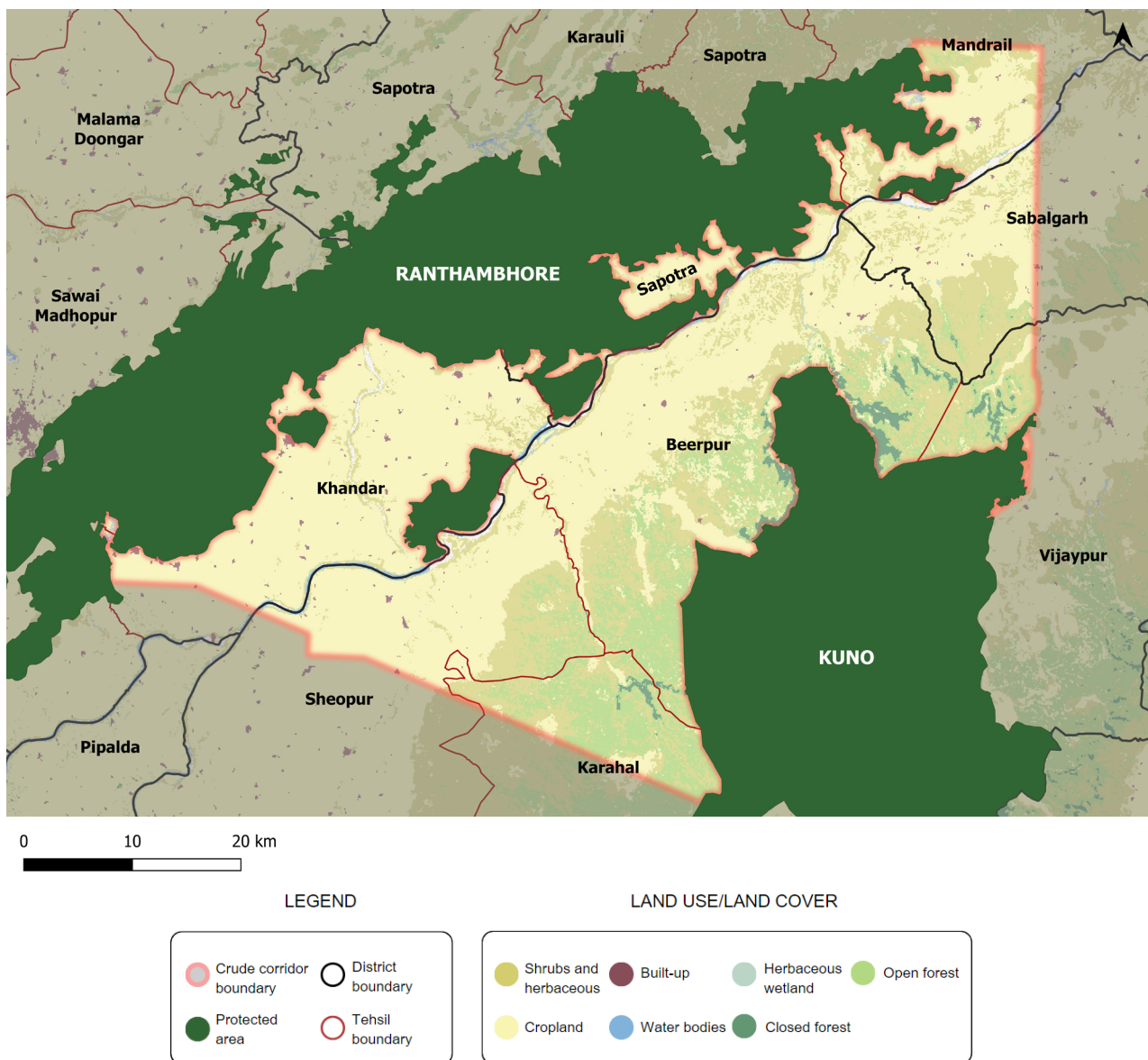


Figure 2. Administrative map representing the districts and tehsils overlapping the Ranthambhore–Kuno Corridor. Mandrail and Sapotra tehsils are a part of the Karauli district (Rajasthan); Sawai Madhopur and Khandar are within the Sawai Madhopur district (Rajasthan); Vijaypur, Beerpur, Sheopur, and Karahal tehsils fall within the Sheopur district (Madhya Pradesh); and Sabalgarh tehsil is a part of the Morena District (Madhya Pradesh).

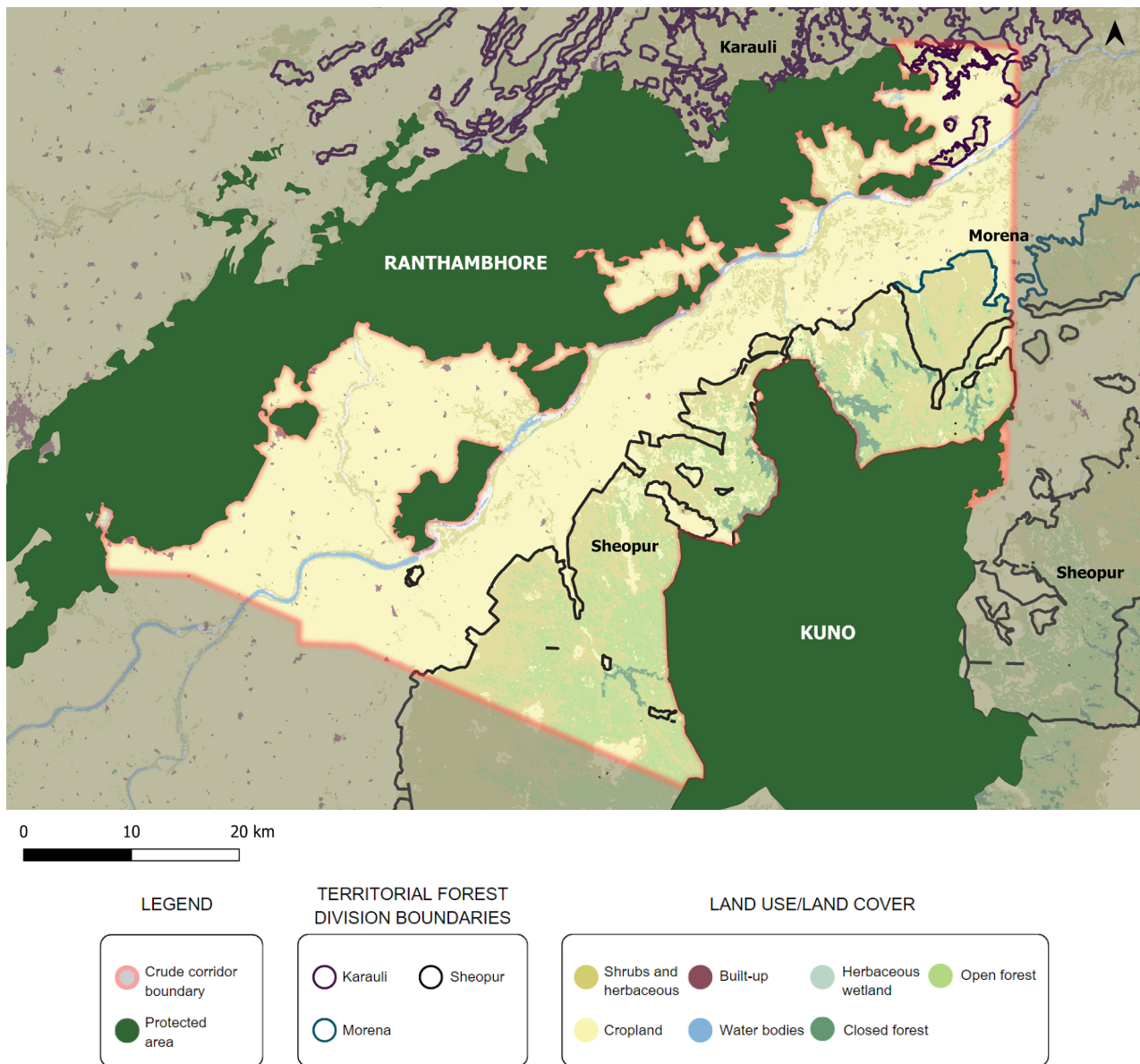


Figure 3. Administrative map representing the Sheopur, Morena and Karauli territorial forest divisions overlapping with the Ranthambhore - Kuno Corridor

## 3.2 Physical characteristics

The Ranthambhore-Kuno Corridor lies to the east of the Aravali mountain range, spanning across the boundary of eastern Rajasthan and north-western Madhya Pradesh. The land use within the corridor is a mosaic of agriculture and natural habitats, including forests, savannas, and ravines. The geomorphological features of the corridor, with an elevation range of 200–500 m, include alluvial plains, plateaus bounded by steep slopes, deep gorges, and ravines, a mix of characteristics of the Aravalli, Vindhyan, and Gwalior rock formations (Shah et al.

2015; Jhala et al. 2021). The scrubby ravines along the banks of the Chambal river, a peculiar feature in this landscape, are intricately carved owing to the easily erodible soil. These ravines reach depths of up to 50 m, with precipitous narrow gullies that are 5–8 km long at some locations. The majority of these ravines are situated near Kailadevi wildlife sanctuary (a part of RTR) on either side of the Chambal river (TCP-RTR).

This corridor is characterized by semi-arid habitat,



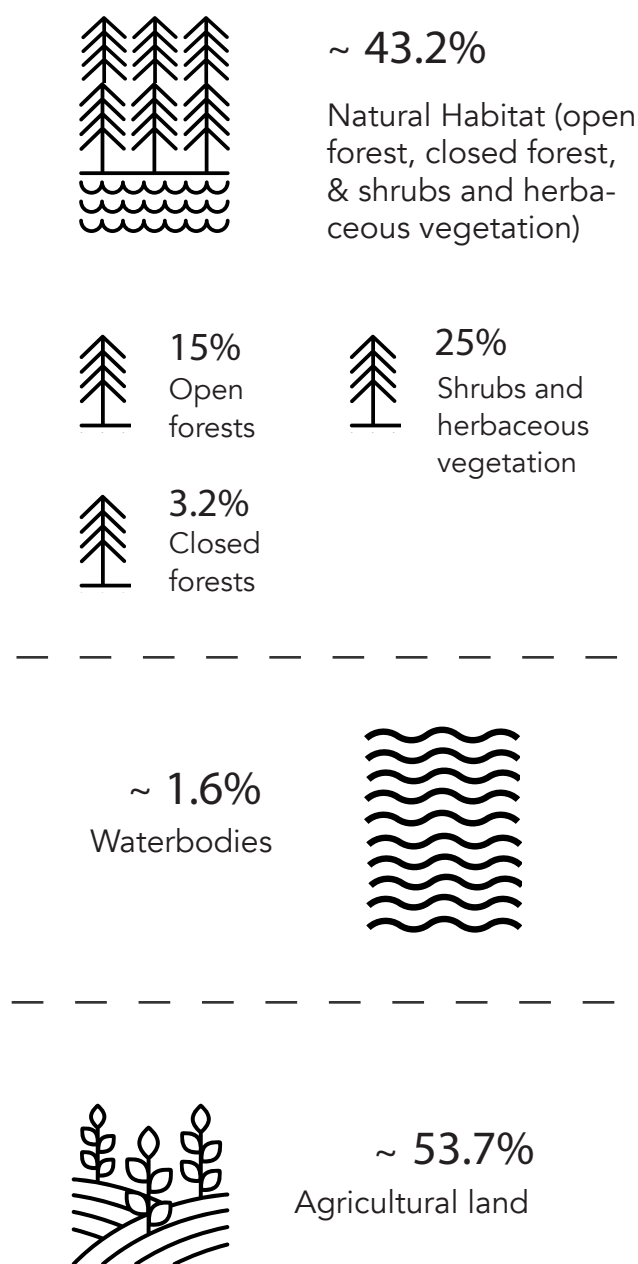
forming a transition zone between the seasonally wetter habitats of peninsular India and the true deserts of north-western India. The vegetation of the corridor is classified as dry deciduous forest, dry deciduous mixed forest, *Anogeissus pendula* scrub forest, dry tropical riverine forest, and dry grassland (Champion and Seth, 1968). Khair (*Acacia catechu*) is the dominant tree in the dry deciduous mixed forests, along with stands of kadaya (*Sterculia urens*), kardhai-dhok (*Anogeissus pendula*), salai (*Boswellia serrata*), raunj (*Acacia leucophloea*), dhow (*Anogeissus latifolia*), amaltas (*Cassia fistula*), palash (*Butea monosperma*), tendu (*Diospyros melanoxylon*), gurjan (*Lannea coromandelica*), and jamun (*Syzygium cumini*). The open scrublands contain shrubs, such as *Euphorbia* spp., with extensive areas dominated by the invasive mesquite (*Prosopis juliflora*) (Shah et al. 2015; Kushwah et al. 2012).

### 3.3 Hydrology

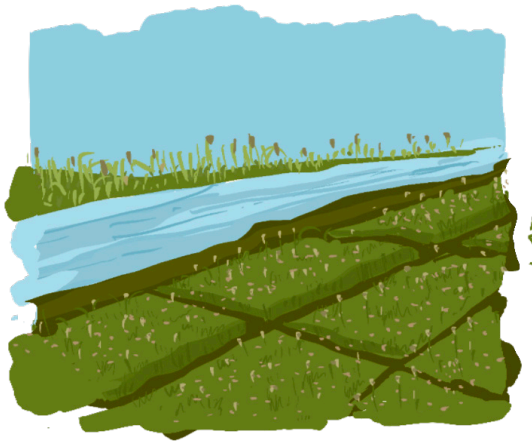
A ~97 km long stretch of the Chambal river, a tributary of the Yamuna river, passes through the middle part of the corridor, forming the state boundary between Madhya Pradesh and Rajasthan. The major tributaries of the Chambal joining within the corridor are the Banas and Kuno rivers (Figure 1); other small tributaries contributing to its flow include the Sip, Dhstoni, Param, Doni, Khareri nala, Sukher nala, Bhumiya kho, Kharair nala, and Jamoniya nala. The Chambal river is one of the cleanest perennial rivers in India (Kaushik and Ghosh, 2015), and it mostly gets flooded during the monsoon season. There are no major interventions across the rivers, i.e., all the rivers within the corridor are free-flowing by nature.

The average annual rainfall of the region is 846 mm, of which 500 mm is concentrated during the monsoon, making the region prone to severe drought during summers. The temperatures in the region can range from  $\leq 2^{\circ}\text{C}$  in January to  $\geq 47^{\circ}\text{C}$  in May (Jhala et al. 2021; Singh et al. 2021).

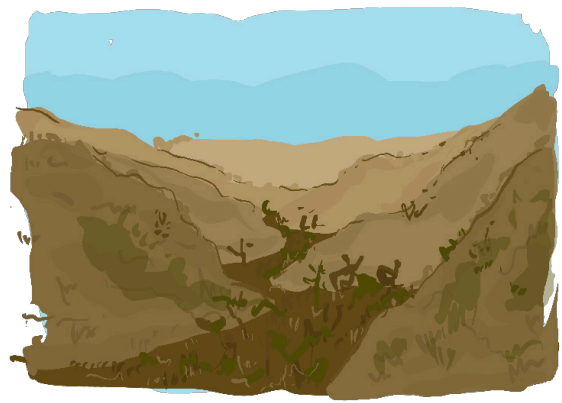
### 3.4 Land use within corridor



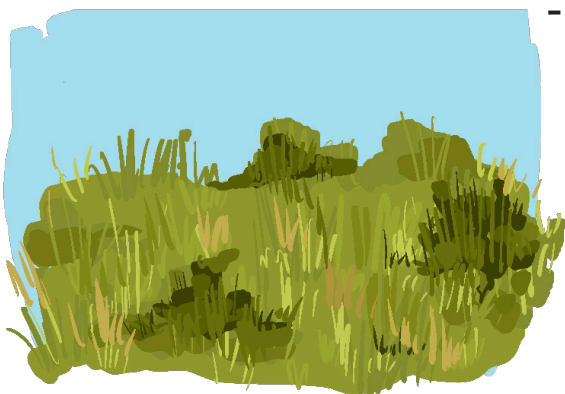
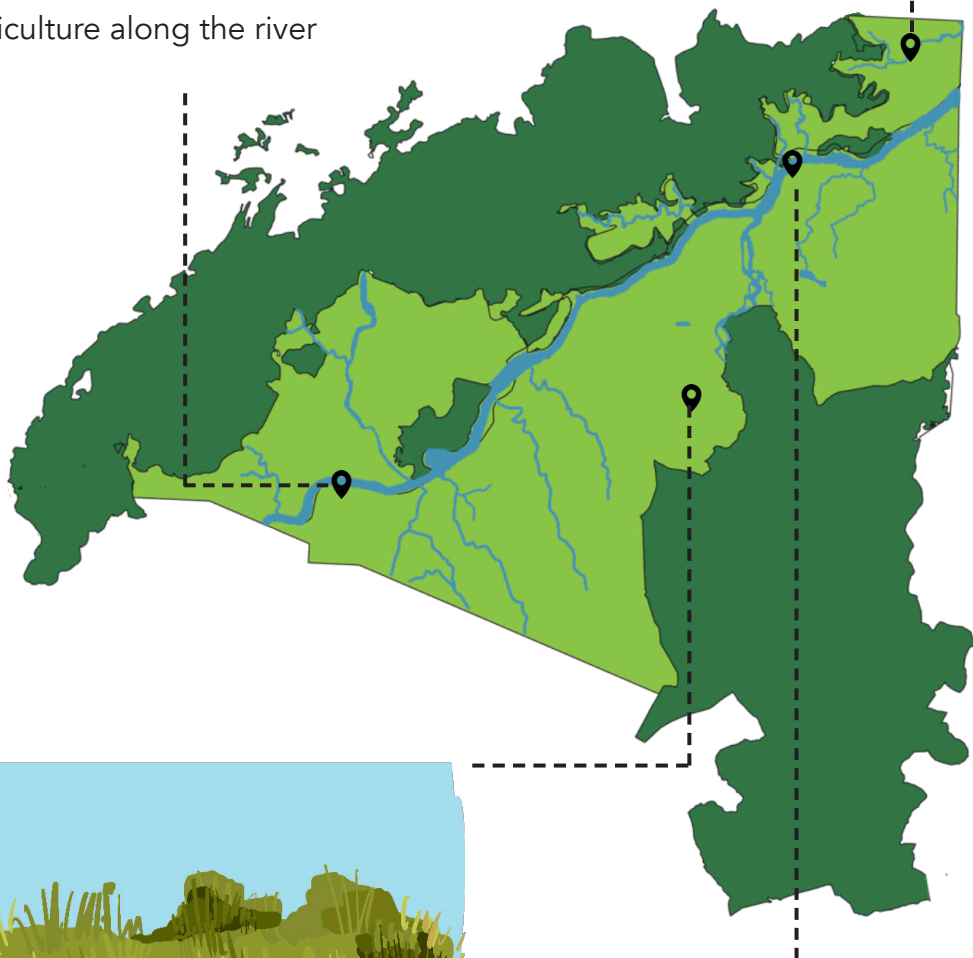
There are two main cropping seasons: Rabi and Kharif. The crop pattern varies seasonally, and the crops grown include millets, wheat, mustard, gram, maize, and vegetables. Most of the agricultural fields are situated all along the Chambal river (TCP-RTR).



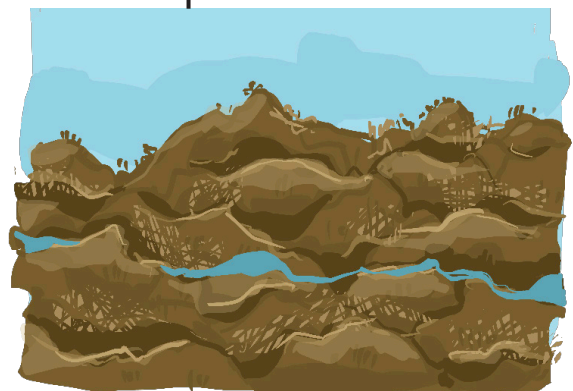
Agriculture along the river



Kailadevi landscape - hills and gorges



Grasslands in the Kuno landscape



Ravines along the river



### 3.5 Critical corridor areas

#### **Banas - Sewti Chambal critical area:**

The region surrounding the Banas river, along with a habitat patch at the confluence of the Banas and Chambal rivers, constitutes the Banas-Sewti Chambal critical area. The vegetated ravines along the Banas river, which flows through the corridor, provide cover and habitat for wildlife using and dispersing through the corridor (Shah et al., 2015; WWF unpublished data, 2020). The area on the northern side of the confluence of the Banas and

Chambal rivers, known as the Sewti Chambal habitat block, is a part of the RTR and likely serves as a stepping stone habitat within the corridor (Figure 4). Currently, ten individual tigers inhabit this critical area (WWF unpublished data, 2020). However, with around 50 small villages, along with the Khandar town and a network of roads, the human footprint in the critical area is substantial (Figure 6; Ranganathan, 2017), increasing the chances of human-wildlife conflict.

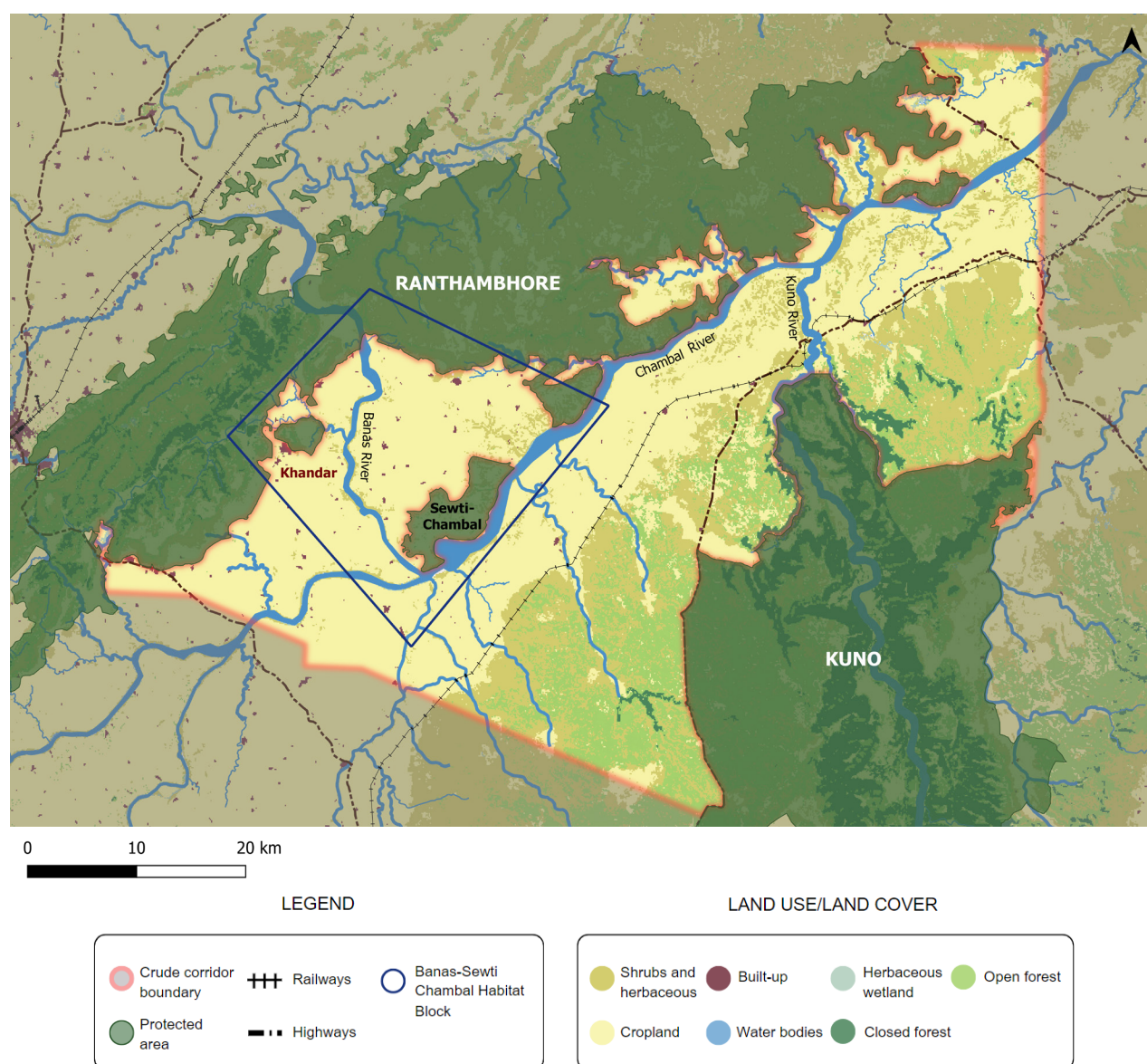


Figure 4. The Banas- Sewti Chambal critical area

### Ravines :

The ravines of the Chambal and Banas rivers are intricate structures formed due to vertical streambank erosion (Figure 5). Covered with scrub, these areas are used by several animals, including tigers, caracals, leopards, and wolves as habitat and for dispersal (Shah et al. 2015; Kannan et al. 2021). These unique geomorphological features along the Chambal, however, are often labeled as “wasteland” (Nair, 2017). The flattening of the

ravines for agriculture stands as a major cause of concern in this corridor. Approximately 20% of the ravines were flattened for agriculture along the Chambal between 1971 and 2010 (Ranga et al., 2016), and government programs aimed at “reclaiming” the ravines still continue to this day (Business Standard, 2020; PTI, 2020). The loss of these ravines would entail the loss of crucial wildlife habitat patches within the corridor, and hence these have been identified as critical areas.

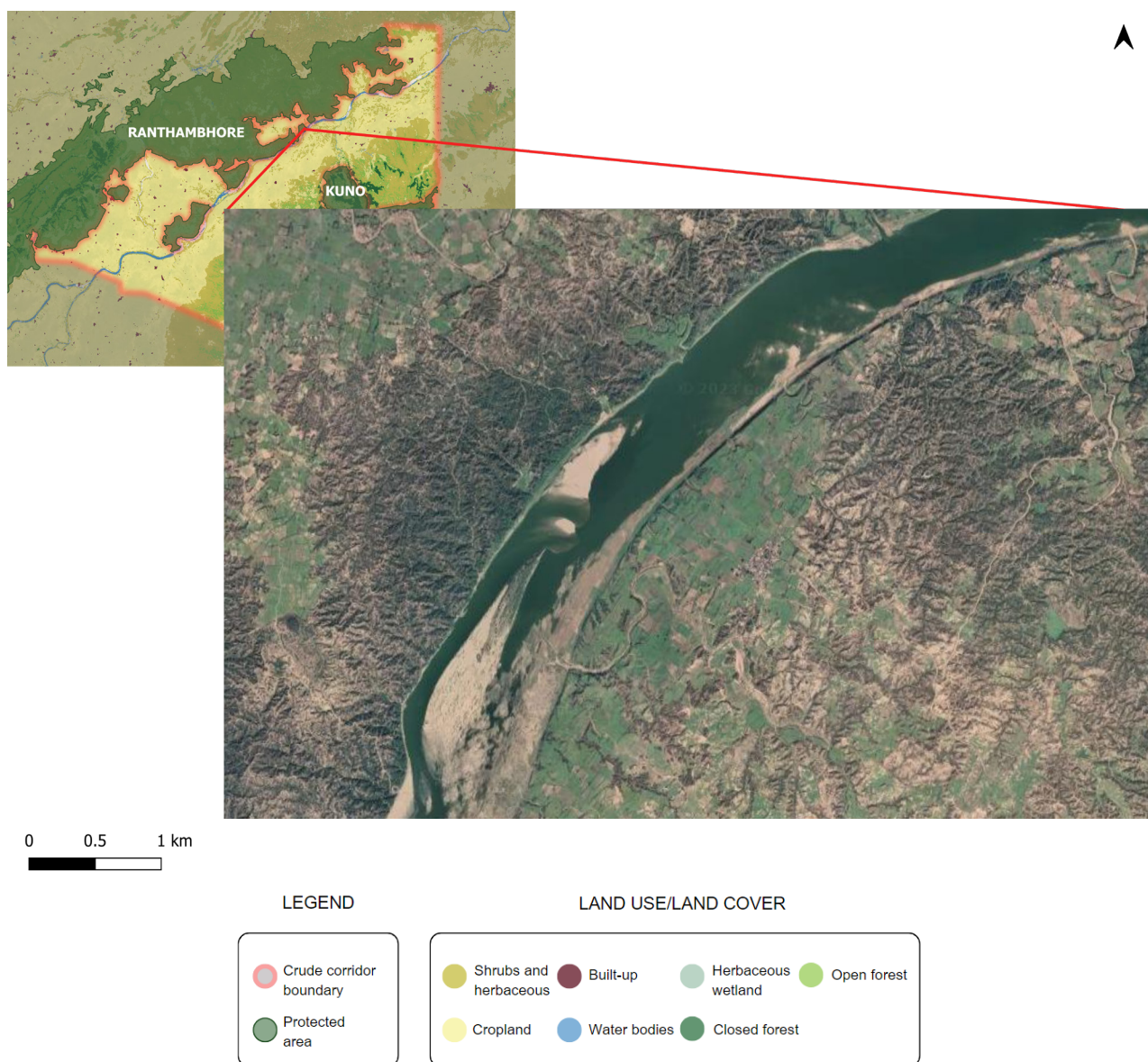


Figure 5. Satellite imagery of the ravines (seen as undulating web-like features) along the Chambal interspersed with small and large patches of agriculture.



## 4 Stakeholders and Management

### 4.1 Land tenure and holding

Approximately 45% of the area in the corridor falls under the jurisdiction of the forest department, which includes a 100 m wide stretch on both sides of the Chambal river as a part of the National

Chambal Wildlife Sanctuary. The agricultural land within the revenue villages is predominantly under private ownership.

### 4.2 Settlements and Communities

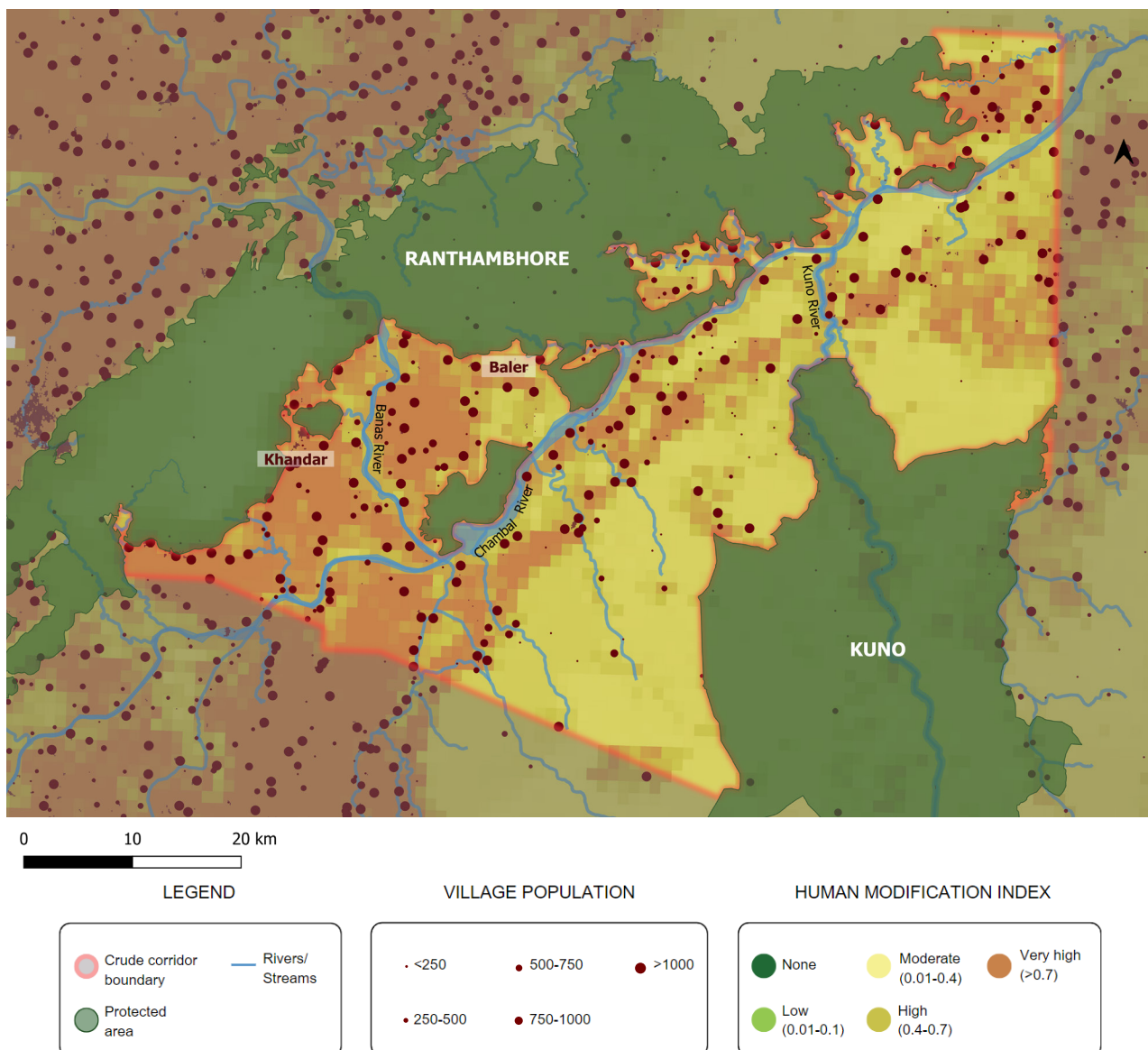


Figure 6. Map representing the distribution of villages within and around the Ranthambhore - Kuno Corridor

The average population density across the corridor is 188 persons/km<sup>2</sup>. There are around 283 villages, mostly distributed on the Rajasthan side and along the Chambal river within the corridor, with an average population of 1168 persons per village (Figure 6; Census of India, 2011). Khandar and Baler, with a population of >10,000 each, are the larger urban centers within the corridor. About 22.5% and 17.4% of the population belong to the scheduled castes and scheduled tribes, respectively (Census of India, 2011). Major tribal communities living in the corridor include the Meena (towards Rajasthan) and the Sahariya, Bhil, Gond, and Majhi (towards MP)

(Census of India, 2011). Agriculture is the primary occupation of these communities. Collection of non-timber forest produce (NTFP) is a traditional income-generation activity and is more common on the Madhya Pradesh side of the corridor. Locals collect resources like fuelwood, grass, and leaves for livestock, along with honey, gum (salai, dhawda, khair), medicinal plants, flowers, and fruit. Indian jujube (*Ziziphus mauritiana*), tendu (*Diospyros melanoxylon*) and mahua flowers (*Madhuca indica*) are among the important plant products found in the corridor (GIM-Perspective Plan-MP-Forest Department, 2017-21)





# 5 Challenges

## 5.1 Infrastructure

### Linear infrastructure:

The total length of the national highway 552, which traverses the eastern part of the corridor, is 86 km. The total length of the state highways passing through the corridor is 20 km. A 76 km-stretch of a single railway line connecting Gwalior to Sheopur passes through the corridor. A couple of irrigation canals also intersect the corridor. Gilai Sagar dam is situated near the village of Itawada, adjacent to the Khandar Range of the RTR. A canal from this dam, approximately 10 feet wide and 5 feet deep, provides irrigation for agriculture around the town of Khandar. Another larger canal cuts through the corridor, originating from the city of Kota, passing through the town of Sheopur, flowing along NH552 near the town of Birpur, and continuing on to Sabalgarh. The canal is about 40 feet wide and in certain places up to 80 feet wide with its depth ranging from 12 to 15 feet.

The average density of linear features in the corridor area, which includes national and state highways as well as railway lines, is 70 m/ km<sup>2</sup>. This calculation excludes several minor roads and canals that crisscross the corridor area. Notably, green infrastructure designed to facilitate wildlife movement, such as underpasses, overpasses, and escape ramps along canals, is currently lacking. However, no studies have yet assessed the impacts of these linear structures on wildlife movement within this corridor.

### Mining:

There are four active stone mines in the Khandar tehsil within the corridor area located near Mei Kalan (Kudh Kho Mine), Gopalpura (Bidyakda Mine), Parda Bardar (Lolai), and Bajoli villages. No systematic studies have been done to examine the impact of these mines on wildlife.

## 5.2 Human-wildlife conflict

Human-wildlife conflict around RTR primarily revolves around livestock depredation or attacks on humans and it tends to be more prevalent during monsoon season (Singh et al. 2015). This is likely because cattle are often not stall-fed during the monsoon season, as fodder is abundant in and around the forest patches. Although the government provides compensation, research suggests that compensation may not alleviate conservation costs for households in Rajasthan because it obscures the actual livelihood cost of human-wildlife conflict for communities around PAs (Johnson et al. 2018). Crop loss inflicted by species like wild pigs and nilgai, which are common in the corridor, often goes unaddressed for compensation (Johnson et al. 2018). Consequently, individuals affected by human-wildlife conflict with non-priority species often bear a higher livelihood cost for conservation (Johnson et al. 2018). Conversations with villagers indicate that compensation is provided for very few depredation cases, as most incidents are not formally registered. This happens because locals are either unaware of the compensation scheme for species like wolves or believe it to be a cumbersome process that requires a greater investment of resources to apply for the compensation than the compensation amount itself. This issue becomes particularly burdensome for impoverished communities (Mahajan et al. 2022; observations during fieldwork, WWF, 2020).



Gray wolf (*Canis lupus*)

## 5.3 Land-use change over time

Ranganathan (2017) examined land-use and land-cover change in the Banas-Sewti Chambal critical area of the corridor and found an overall decrease in vegetation and bare soil over a period from 2011 to 2016. There was also a simultaneous rise in cropland and sand in the critical area. While formal land use change analysis has not been carried out in other parts of the corridor, the risk of land use change across the entire corridor remains high due to its semi-arid nature. Among the various landscapes in India, arid and semi-arid regions present a unique set of challenges. These regions have sparse tree cover, and their current governance rarely recognizes them as important ecosystems because they are easily convertible for agriculture, infrastructure development, and industrial use (Majgaonkar et al. 2019).

## 5.4 Illegal activities

### Wildlife crime

Unregulated fishing and turtle poaching, employing various methods such as gill nets, baited hook-lines, and dynamites, are rampant in the Chambal river and have adverse effects on other species like gharials, muggers, otters, and numerous bird species (Nair, 2013; Taigor and Rao, 2010). Gill nets, in particular, are responsible for entangling and drowning juvenile gharials, thereby negatively impacting their survival and recruitment in smaller size classes (Nair et al. 2013). Along with the species supported by the Chambal river, several other species found in the corridor (Table 1) are involved in national and international illegal wildlife trade. The location of poaching or trade of a species may not always be recorded due to the clandestine nature of the crime and the reliance on detection and enforcement measures. Although systematic studies from the corridor are currently lacking, the presence of poaching is suggested by camera-trap images capturing armed poachers at certain sites within the corridor (Shah et al. 2015).





Table 1. Some hunted species and their uses (References: Sethi, 2021, Niraj et al. 2019, Ramchandran et al. 2017, and Velho et al. 2012)

| Species                                    | Type of Use   | Description of Use  |
|--|---|---|
| Tiger                                      | Subsistence/<br>Commercial hunting                              | Illegal wildlife Trade of nails, whiskers, bones, skin, claws, and heads<br>Subsistence hunting for traditional medicinal and cultural uses                     |
| Leopard                                    | Commercial  | Illegal wildlife Trade of nails, whisker, bones, skin, claws, head  |
| Snakes                                     | Subsistence/<br>Commercial/<br>Alternative source of livelihood | Illegal wildlife trade of skins<br>Subsistence hunting for bushmeat and medicinal value<br>Used in street performance   |
| Alexandrine Parakeet/ Rose-Ringed Parakeet | Subsistence/Alternative Source of Livelihood                    | Used in traditional and cultural practices<br>Sold locally and internationally for pet trade  |
| Monitor Lizard                             | Subsistence/Commercial  | Skin and fat oil is used for traditional and medicinal uses locally<br>Bushmeat consumption for subsistence<br>Testis are sold for Traditional Chinese Medicine |
| Quails/ Partridges                         | Subsistence/<br>Commercial                                      | Consumed as bushmeat<br>Meat sold to local eateries   |
| Peacock                                    | Subsistence/<br>Commercial                                      | Subsistence for bushmeat, medicinal and aesthetic values<br>Feathers are sold commercially for decorative purposes  |
| Sloth Bear                                 | Subsistence/Commercial  | Subsistence hunting for medicinal values<br>Bear bile makes part of illegal wildlife trade for Oriental Medicine  |
| Turtle                                     | Subsistence/Commercial  | Subsistence hunting for bushmeat, medicinal and traditional value<br>Sold in wildlife trade market for pets   |
| Wild Primates                              | Alternate source of livelihood                                  | Used in street performances   |
| Black Buck                                 | Commercial  | Antlers and skins are sold as part of the illegal wildlife trade.   |



Ravines along the Chambal river  
©Tanuj Mark

### Sand mining

Large-scale, illegal sand mining along the river banks is a major concern in the corridor because it leads to the destruction of riparian habitats. Species such as gharials, freshwater turtles, black-bellied terns, and skimmers which utilise the stretch of the Chambal River passing through the corridor and beyond, require undisturbed sand deposits for breeding and nesting (Nair 2017; Ranganathan, 2017). The indiscriminate sand mining exacerbates the adverse impacts of dams and a lack of ecological flow in rivers on these threatened species. Substantial quantities of sand extracted from this area are transported to various locations within Rajasthan and to neighboring states. The primary mining sites are situated near the villages of Sawanta and Bhoori Pahadi, where the regular movement of trucks and tractors laden with sand is a common sight (Thorat and Gurjer, 2010; Observations during fieldwork - WWF, 2020). A lack of documentation and enforcement capacity has allowed the number of mines to exponentially increase in the region. Here, the sand mafia is feared and has a strong foothold in the region (Shah et al. 2015; Nair, 2017).

## 5.5 Climate vulnerability

With the looming impact of climate change, the state of Rajasthan is likely to experience warming, with the annual mean temperature projected to increase by 2–2.5 °C between 2021 and 2050, while rainfall is likely to show a slight decrease. These projections of climate variability indicate a greater frequency of extreme evaporation and shortage of water (Singh et al., 2019), which are likely to have an impact on agriculture within the corridor. The effects of climate change on the biodiversity of the region and the spread of desertification into the eastern part of Rajasthan are probably the most vulnerable aspects of this. Additionally, if apex predators decline, both wild ungulates and feral cattle can reach high densities, reducing top-down control. Ensuing overgrazing can lead to plant biodiversity loss and undermine nature's ability to regulate greenhouse gas emissions and protect against extreme weather, thus accelerating climate change. The carnivore population ensures that grazing by wild ungulates is maintained to a healthy and manageable level. Without pressure from tertiary consumers, the plant species richness of the Ranthambhore–Kuno Conservation Unit would fall far lower than it is today (Ranganathan, 2017; Wallach et al. 2015).



## 5.6 Other challenges

### Invasive species

The spread of alien invasive species through all ecosystems is a matter of great concern, as evidenced by the presence of exotic species *Prosopis juliflora* and *Lantana camara* in this region (Shah et al. 2015). The quality of habitat is adversely affected by the spread of these invasive weed species, especially in semi-arid regions, as they crowd out native plants that support the biodiversity of the ecosystem (Everard et al. 2017). Another dominant weed in this landscape is the aromatic American mint *Hyptis suaveolens* (Shah et al. 2015). Invasive weeds have also been found to cause water stress in semi-arid climatic conditions (Everard et al. 2017; Dayal, 2007). Furthermore, encroachment by woody invasive plants has been recognized as a major driver of climate change, especially in grassland ecosystems. Reducing grass cover alters herbivore species composition from grazing-dominated to browsing-dominated communities, thus influencing carnivore abundance and distribution, especially for understudied and range-restricted mesopredators like the Indian desert fox and other specialist species (Misher and Vanak, 2021).

### Diseases

Canine distemper virus (CDV) is a highly contagious disease with a very high fatality rate among canids. CDV has been recognised as the cause of death in Amur tigers at Sikhote Alin (Gilbert et al. 2015). A study conducted in RTR revealed a moderate to high risk of exposure to CDV for tigers as well as leopards. With a high density of tigers in RTR the transmission of the pathogen in case of an outbreak could be fairly rapid and is hence a serious cause for concern (Sidhu et al. 2019). Additionally, Carnivore Parvovirus 1 (CP1) has also been detected in sloth bears, dholes, striped hyenas among other carnivores in India. Such multi-host pathogens are an emerging threat to wildlife and have the potential to cause species decline and population extinction (Shetty, 2019).



## 6 Recommendations

1. Rajasthan currently lacks a policy for crop compensation and property damage (Johnson et al. 2018). Comprehensive surveys are needed to gain a thorough understanding of crop loss patterns and the specific areas affected by crop damage within the corridor. Establishing an effective crop loss compensation mechanism and a crop insurance policy could significantly mitigate financial losses caused by wildlife, reduce negative sentiments towards wildlife, and foster greater tolerance, and consequently elevate the priority of wildlife conservation among local farmers.
2. While the Rajasthan state government provides compensation for livestock depredation by wildlife, the compensation application process is cumbersome, and there is a lack of awareness about compensation provided for depredation caused by species like wolves and hyenas which are common across the corridor. As suggested by Mahajan et al. (2022), it is imperative to assess the efficiency of the compensation payment mechanism, as this information is crucial for shaping future policies.
3. Local communities are the primary stakeholders within this agriculture-dominated corridor. Refocusing management to a more decentralized level of governance and public involvement would be crucial to ensure community stewardship for corridor conservation, although that would be different from the traditional top-down models of decision-making that historically have been prevalent in the country (Singh et al. 2005). An evaluation of the Joint Forest Management committees in the corridor, including their achievements, status and challenges to their functioning would be the first step towards understanding what has worked so far, what hasn't and how we can work towards improving participatory management of the corridor.
4. For corridor dwellers, like the striped hyena and less studied species like the caracal, the conservation value of non PAs, small scrub patches and ravines that provide refuge and prevent persecution is high. These areas should be systematically mapped, monitored and protected and they should be incorporated into the Tiger Conservation Plan of RTR as focal areas.





## 7 Conservation Activities



The semi-arid corridor landscape turns beautifully green during monsoons  
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Listed below are some of the organizations that work in and around the corridor on wildlife conservation and other related activities.

### **Tiger Watch**

Tiger Watch is a wildlife conservation organization that operates primarily in RTR and the surrounding landscape. Their focal areas of work include wildlife crime, conservation awareness, wildlife research, and capacity building for local communities and the forest department.

### **Prakratik Society**

Prakratik Society is an environmental and social organization. Their work primarily focuses on education, afforestation, healthcare, and animal husbandry.

### **Ranthambhore Foundation**

The Ranthambhore Foundation is a non-government

organization. It primarily works on community engagement in conservation interventions and conservation awareness in schools.

### **World Wide Fund for Nature-India (WWF-India)**

WWF-India provides technical assistance to the forest department in monitoring and surveys. They also conduct scientific research to influence policies, management, and conservation plans. Additionally, the organization also works on community-based conservation initiatives.

### **Environment and Education Society (EES)**

EES is an NGO that focuses on the protection of local biodiversity by spreading awareness about the environment and wildlife. They also work with local stakeholders for the protection of historical places, art, and local cultural knowledge of handicrafts, along with water conservation, sanitation, and de-addiction.

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## 8.2 Resource Checklist

1. Census for SC ST in the region.

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<https://censusindia.gov.in/2011census/PCA/ST.html>

<https://censusindia.gov.in/2011census/PCA/SC.html>

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## 9 Supplementary Information

### Delineation of the crude corridor boundary:

The indicators and the quantitative description in the corridor profile have been calculated using a crude corridor boundary. The crude boundary was delineated based on a standardized protocol developed by a coalition working group. Since there is no functional connectivity data, we began the delineation exercise by generating a minimum convex polygon (MCP) around the two PAs (Ranthambhore and Kuno). The least-cost corridor identified by Qureshi et al. (2014) fell within this MCP. Occupancy data from around Ranthambhore was overlaid, and the boundary was adjusted to incorporate the grids with high and moderate occupancy values. Since no occupancy data was available for MP, the boundary was modified to include the beats that partially overlapped with or were very close to the MCP.

### Estimation of principal indicators:

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 method of estimating the value of each indicator is available online at <http://corridorcoalition.org/CWC/about.htm>











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