

Current Status, Ecological Role, Anthropogenic Threats, and Conservation Priorities of the Striped Hyena (*Hyaena hyaena*) in Pakistan

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Running Title: Current Status of the Striped Hyena in Pakistan

Abstract: The striped hyena (*Hyaena hyaena*) is technically listed as Endangered in Pakistan, yet we know surprisingly little about its actual situation on the ground. Basic facts—like how many there are, where exactly they live, or whether their numbers are going up or down—are completely missing. To figure out what we do know, we combed through published papers and essential reports to look at the hyena's status, what it does for the environment, and the threats pushing it toward the edge. Occasional sightings tell us they still exist in parts of Balochistan, Sindh, and Khyber Pakhtunkhwa. However, no one has actually mapped their full range. The last time anyone even tried a structured survey was a small effort in Kirthar National Park over two decades ago, back in 2001. What little literature we have points to some serious problems. People are hunting them illegally, often killing them in retaliation because they mistake scavenging for predation. On top of that, their habitat is falling apart and their natural prey is vanishing. Our provincial wildlife laws might look good on paper, but out in the field, they just are not enforced. This is a huge loss, considering the hyena provides massive ecosystem services by clearing out dead animals and stopping disease—something most local communities do not realize. Right now, Pakistan is missing the bare minimum tools for conservation: we have zero genetic data, no population estimates, and no habitat models. If we want to move beyond just putting the hyena on an endangered list, we desperately need a proper national survey, real anti-poaching enforcement, and provinces working together.

Key words: Scavenger ecology, Kirthar National Park, Balochistan, human-wildlife conflict, illegal hunting, carnivore conservation, Pakistan biodiversity

INTRODUCTION

Big carnivores do a lot of the heavy lifting in nature. When they disappear because of hunting or habitat destruction, the whole ecosystem feels the shock (Ripple et al., 2014; Winnie Jr. and Creel, 2017). The hyena family is small—just four species—but they are built to rule the world's dry and semi-dry regions (Taylor et al., 2018). Most researchers flock to Africa to study the spotted hyena, leaving the striped hyena (*Hyaena hyaena*) mostly ignored (Holekamp and Kolowski, 2009; Wilkinson et al., 2024).

Geographically speaking, the striped hyena is spread across a huge area, from Africa through the Middle East, all the way into India (Bentabet et al., 2025). As scavengers, they have heavy-duty jaws and teeth made cracking open massive bones to get at the marrow (Naidoo, 2024). This diet makes them nature's clean-up crew. By eating rotting meat, they stop diseases from spreading and help recycle nutrients (Kendall et al., 2025). When their natural food sources dry up, they pivot to eating dead livestock or garbage. However, getting that close to human settlements usually ends badly for the hyena (Alam and Khan, 2015; Alamri et al., 2025).

Globally, the IUCN considers them Near Threatened, with an estimated population sitting somewhere below 10,000 adults (AbiSaid and Dloniak, 2015). Even that number is probably too optimistic today, given the constant poaching, illegal trade for traditional medicine, and shrinking habitats (Matczak, 2026; El Alami et al., 2026). Pakistan sits right at

the eastern edge of where these animals live. While our neighbors in India, Nepal, and Iran are busy using camera traps and mapping software to track their hyenas (Singh et al., 2014; Devkota et al., 2025; Almasieh et al., 2022), Pakistan has fallen way behind. We are flying blind. We cannot build conservation plans or tap into global funding without basic data.

This review tries to bridge that gap. We pulled together whatever peer-reviewed studies and grey literature we could find to see where the species stands in Pakistan. We wanted to pin down where they live, categorize the human threats they face, see if our laws are actually working, and figure out what research needs to happen right now.

MATERIALS AND METHODS

You cannot run a standard systematic review on something this poorly documented. The data on the striped hyena in Pakistan is just too scattered. Therefore, we went with a narrative review, which is standard practice when you are dealing with severely data-deficient conservation issues (Dicks et al., 2014). We dug through Web of Science, Scopus, Google Scholar, and GBIF. Our search focused on the striped hyena in Pakistan, specifically looking at Balochistan, Sindh, and Khyber Pakhtunkhwa, along with broader terms like human-wildlife conflict.

We looked at everything from 1977 up to May 2026. This meant pulling journal articles, government reports, university theses, and even media reports when they mentioned a specific sighting or poaching incident. Out of about 120 sources we found, 93 made it into the final paper.

We only leaned on grey literature when primary science was missing. To keep things standardized, we sorted all the threats we found using the official IUCN Threat Classification Scheme (Version 3.2).

RESULTS AND DISCUSSION

Ecosystem services and missing genetics

Because we do not have spotted hyenas in Pakistan, the striped hyena takes on the role of the top bone-processing scavenger (Khan et al., 2022). They break down carcasses fast, which cuts down the time diseases can linger on the landscape (Ahmad et al., 2012). To understand how valuable this is, look at a similar study in India: researchers found that striped hyenas cleaned up over 23 tons of dead livestock in one sanctuary alone every year. That is a free waste disposal service worth up to \$50,000 annually (Panda et al., 2023a). People in rural Pakistan get this exact same benefit, but nobody measures or acknowledges it.

Another massive blind spot is their genetics. We assume our hyenas belong to the Indian subcontinental subspecies just because of where they live. However, there is not a single published genetic or morphometric study on a hyena from Pakistan (Koepfli et al., 2006). If we ever find out that, our populations are genetically unique or that they form a vital link with hyenas in Iran, their conservation priority would shoot up overnight.

Where are they now?

Back in 1977, T.J. Roberts noted that striped hyenas were somewhat common in the rocky parts of Balochistan and rare in Sindh. Since then, we have barely looked for them. In 2001, researchers spent four weeks trying to find them in Kirthar National Park using bait and spotlights. They did not see even one, though they did find tracks (Veninga, 2001).

More recently, we have had a few signs of life. Field notes from the mid-2000s confirmed they were still in Balochistan (Ghalib et al., 2019), and data from 2021 and 2022 showed them being caught up in livestock conflicts in Khyber Pakhtunkhwa (Khan et al., 2025b). Just recently, in early 2025, the media reported a sighting in the Koh-i-Sulaiman Mountains (Dawn, 2025). However, a few scattered reports do not make a population estimate. We have no idea how many are left or if they are heading toward local extinction.

The human impact

Humans are overwhelmingly the biggest threat. Illegal hunting is rampant. Hyenas are shot, snared, and poisoned all the time (Khan et al., 2024). Sometimes it is for traditional medicine, where their hair, teeth, or meat are used in folk remedies (CITES, 2025b). Other times, they are killed simply out of fear and superstition (Akash et al., 2021). The hunting can be brutal; one unverified media report claimed a single hunter in the Koh-i-Sulaiman range wiped out three hyenas in one season, along with dozens of wolves and foxes (Dawn, 2025).

Retaliatory killing is another major killer, and it is usually based on a misunderstanding. Because hyenas eat dead things, a farmer will often see one chewing on a dead cow and assume the hyena killed it. A study in Balochistan looked at 876 dead livestock over a year. Hyenas actually killed just 0.6% of them. Wolves and caracals did almost all

the hunting. Yet, the locals still blamed and hated the hyenas (Ullah et al., 2024).

Habitat destruction is the final nail in the coffin. Farms are expanding, livestock are overgrazing, and new roads are cutting through the wilderness in Sindh and Balochistan (Hassan et al., 2020). Hyenas travel huge distances to find enough carrion. Roads cut off their routes and lead to fatal vehicle strikes, which is already a leading cause of death for hyenas in neighboring Iran (Almasieh et al., 2022). With natural prey dying out from poaching, hyenas are forced to look for food near human garbage dumps, putting them right in the crosshairs.

Laws that only exist on paper

Pakistan's wildlife laws technically protect the striped hyena. You are not allowed to hunt or sell them in any of the four provinces (Razzaq and Ali, 2023). Pakistan even pushed to get them listed under CITES Appendix III back in 2014.

However, out in the field, these laws fall apart. Wildlife departments do not have the labor, the budgets, or the community support to actually patrol the rugged areas where hyenas live. Kirthar National Park is the only protected area in their known range, and it does not even have a specific plan for carnivores.

CONCLUSION

The striped hyena is barely hanging on in Pakistan, and it is doing so completely off the scientific radar. Between illegal hunting, angry farmers, and vanishing habitats, the odds are heavily stacked against them. Having strong laws means nothing if there is no enforcement on the ground. We have the technology to fix this. Camera traps, scat analysis, and habitat mapping are inexpensive and already being used for other animals in the country. What we are lacking is simply the institutional will to do it. If we do not coordinate a real national survey and crack down on poaching soon, we will lose the striped hyena before we even realize they are gone.

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TABLES

Table I: Core knowledge gaps for *Hyaena hyaena* in Pakistan alongside needed baseline data.

Gap Category	What We Know in Pakistan	What We Need to Do	Priority
Population size	No estimate exists at any level.	Set up camera trap grids and run occupancy models.	Critical
Species distribution	Only a few confirmed spots since 1977.	Run a presence-absence survey across at least 30 sites.	Critical
Genetic structure	Zero molecular data published.	Collect scat for non-invasive DNA sampling.	Critical
Hunting mortality	We know it happens, but not how often.	Survey local communities and gather law enforcement data.	High
Habitat connectivity	No models exist to show where they can travel.	Build MaxEnt models using satellite environmental data.	High
Human-wildlife conflict	Only one study exists in Balochistan.	Conduct structured household surveys across all provinces.	High
Climate change	Completely unassessed.	Integrate climate projections into habitat models.	Moderate