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Conserving Wildlife in an Age of Biodiversity Decline: A Global Review with Indian Case Studies

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Abstract

Biodiversity, the variety of genes, species and ecosystems on Earth, underpins food security, clean water, a stable climate and much of human well-being, yet it is declining faster than at any point in human history. This paper reviews the current state of global biodiversity, the main drivers of its loss, and the strategies used to conserve wildlife. Drawing on recent assessments, including the IUCN Red List and WWF's Living Planet Report 2024, it notes that monitored vertebrate populations have fallen by an average of 73 per cent since 1970 and that nearly 49,000 assessed species are now threatened with extinction. It then turns to India, a megadiverse country, through three cases: the long recovery of the tiger, the reintroduction of the cheetah, and the conflict between renewable-energy infrastructure and the Great Indian Bustard. The paper argues that conservation succeeds when legal protection, secure habitat, good science and the consent of local communities work together, and that the Kunming-Montreal Global Biodiversity Framework, facing its first global review in October 2026, will be judged on delivery rather than ambition.

Keywords: biodiversity; wildlife conservation; protected areas; human–wildlife conflict; Project Tiger; Project Cheetah; Kunming-Montreal Global Biodiversity Framework; India

1. Introduction

Most of the time, biodiversity is invisible to us precisely because it works. Bees set fruit, wetlands soak up floodwater, soil organisms turn waste into fertility and forests draw carbon out of the air, all without sending an invoice. We tend to notice these services only when they fail. Over the past half-century, the evidence that they are failing, or at least fraying badly, has become very hard to ignore.

The Convention on Biological Diversity defines biodiversity as the variability among living organisms from all sources, including diversity within species, between species and of ecosystems (United Nations, art. 2). The breadth of that definition matters. Conservation has too often been reduced to the fate of a few charismatic animals. Tigers and elephants deserve attention, but so do fungi, freshwater mussels and the grasslands most people drive past without a second glance.

This paper sets out what we know about the scale of biodiversity loss, why it is happening, and what has worked in protecting wildlife. It gives particular attention to India, which holds roughly 7 to 8 per cent of the world's recorded species on about 2.4 per cent of its land area and includes parts of four of the 36 recognised biodiversity hotspots (Ministry of Environment, Forest and Climate Change; Critical Ecosystem Partnership Fund). India is a useful case not because its record is spotless, since it is not, but because it combines real conservation successes with some of the sharpest pressures found anywhere: a population of about 1.4 billion, rapid infrastructure growth, and millions of people who live alongside large and sometimes dangerous animals.

2. The State of Global Biodiversity

The most widely used measure of extinction risk is the IUCN Red List. Its October 2025 update covered 172,620 species, of which 48,646 were classed as threatened with extinction (IUCN). That update also recorded that more than half of the world's bird species are now in decline, while three Arctic seal species moved closer to extinction as sea ice retreats (IUCN). These numbers are best read as a floor rather than a ceiling. Only a small fraction of the planet's estimated species has been assessed, and plants, invertebrates and fungi remain badly under-represented.

Population trends tell a similar story. WWF's Living Planet Report 2024 found a 73 per cent average decline in monitored vertebrate populations between 1970 and 2020, based on nearly 35,000 population trends across 5,495 species (WWF). Declines were steepest in Latin America and the Caribbean (95 per cent), Africa (76 per cent) and the Asia-Pacific region (60 per cent). This headline figure is often misread. It is an average rate of change across populations, not a claim that 73 per cent of all wild animals have disappeared, and roughly half of the populations studied were in fact stable or increasing ("The 2024 Living Planet Index"). The trend is still alarming, but precision about what it means strengthens rather than weakens the case for action.

Taken together with the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) estimate that around one million animal and plant species are threatened with extinction, many within decades (IPBES), these findings have led some researchers to describe the present moment as the early stage of a sixth mass extinction. Ceballos, Ehrlich and Dirzo go further, arguing that the loss of populations, rather than species alone, amounts to a "biological annihilation" that erodes ecosystem function long before the last individual of a species dies (E6089).

3. Drivers of Biodiversity Loss

IPBES identifies five direct drivers of change in nature, ranked by global impact: changes in land and sea use, direct exploitation of organisms, climate change, pollution, and invasive alien species (IPBES). Land-use change comes first by a wide margin. When a forest becomes a soybean field or a mangrove becomes a shrimp farm, most of the species that depended on it have nowhere else to go. Habitat loss also works through fragmentation: a forest cut into small patches by roads and farms may look intact from a distance but can no longer support wide-ranging animals or maintain healthy gene flow.

Direct exploitation, through overfishing, hunting and the wildlife trade, is the leading driver in the oceans. Climate change, meanwhile, is moving from a future threat to a present one. It shifts the ranges species can survive in, disrupts the timing of breeding and migration, and bleaches coral reefs. Pollution, from pesticide runoff to plastics, and invasive species, which are especially destructive on islands, complete the list.

Behind these direct drivers sit indirect ones: patterns of production and consumption, trade, population change, technology, and weak governance. This is why conservation cannot be treated only as a matter for forest departments and wildlife biologists. Decisions about agriculture subsidies, energy routes, urban planning and supply chains shape biodiversity outcomes far more than most conservation budgets do.

4. Why Biodiversity Matters

The case for conservation is sometimes framed as a choice between moral and economic arguments, but both point the same way. On the economic side, the World Economic Forum estimated that more than half of global GDP, about US$44 trillion, is moderately or highly dependent on nature and its services (World Economic Forum). The Dasgupta Review argued that nature should be treated as an asset on the national balance sheet, and that we have been drawing it down without accounting for the loss (Dasgupta).

India offers one of the clearest illustrations of what happens when a species quietly disappears from an ecosystem. In the 1990s, the veterinary drug diclofenac, given to cattle, poisoned the vultures that fed on their carcasses, and populations of several vulture species collapsed by more than 95 per cent. With fewer vultures to clean up carcasses, disease and feral dog populations rose. Frank and Sudarshan estimate that the collapse led to roughly half a million additional human deaths between 2000 and 2005 (3007). Few people thought of vultures as a public-health service until they were gone.

There are also reasons that do not reduce to money. Many communities hold particular species, forests and rivers as sacred, and many people simply believe that other forms of life have a

right to exist. A mature conservation policy can hold all of these values together without forcing them into a single currency.

5. Approaches to Wildlife Conservation

5.1 Protected areas

Protected areas remain the backbone of conservation. According to the Protected Planet Report 2024, about 17.6 per cent of land and inland waters and 8.4 per cent of the ocean fall within protected and conserved areas (UNEP-WCMC and IUCN). Target 3 of the Kunming-Montreal Global Biodiversity Framework asks countries to protect 30 per cent of land and sea by 2030 (Convention on Biological Diversity, Kunming-Montreal). Coverage, however, is not the same as effectiveness. So-called paper parks, which exist on maps but lack staff, funding or enforcement, do little for wildlife, and poorly designed protected areas can displace the people who have long lived in and cared for these landscapes.

5.2 Species recovery and reintroduction

Targeted recovery programmes show that decline is not destiny. In 2025 the green sea turtle was moved from Endangered to Least Concern on the global Red List after decades of nesting-beach protection and reduced harvest (IUCN). Reintroductions, captive breeding and translocations can restore species to places they have vanished from, though they are expensive, slow and only as good as the habitat they return animals to.

5.3 Community and Indigenous stewardship

Indigenous peoples manage or hold tenure rights over at least a quarter of the world's land surface, much of it in relatively good ecological condition (Garnett et al. 369). Conservation that recognises these rights, rather than overriding them, tends to be more durable and more just. The Kunming-Montreal framework now explicitly acknowledges the role of Indigenous peoples and local communities, a notable shift from older models of "fortress conservation."

5.4 Law, policy and finance

International agreements such as CITES, which regulates trade in endangered species, and the Convention on Biological Diversity set the broader rules. The Kunming-Montreal framework, adopted in December 2022, contains 23 targets for 2030 and a commitment to mobilise at least US$200 billion a year for biodiversity from all sources (Convention on Biological Diversity, Kunming-Montreal). Whether that money materialises will decide much of what follows.

6. Evidence from India

6.1 Project Tiger: a recovery with lessons

When Project Tiger began in 1973, India's tigers were being lost to hunting and habitat clearance. Half a century later, the programme is one of the world's most cited conservation recoveries. The 2022 national estimate put the population at about 3,682 tigers, up from roughly 1,411 in 2006, which is around three-quarters of the world's wild tigers (Qureshi et al.). The network has grown to 58 tiger reserves. The sixth national estimation began in January 2026, with results expected in 2027, and early field reports suggest tigers are increasingly dispersing into forests outside reserve boundaries ("India's 2026 Tiger Census").

The success has costs that deserve honest discussion. Several reserves have relocated villages, and the quality of consent in these moves has varied. Tigers moving beyond reserves bring them into closer contact with farms and livestock, and conflict can erode local support. The central lesson is that a growing population now depends less on individual reserves and more on the corridors that link them, which cross highways, railways and agricultural land.

6.2 Project Cheetah: ambition and uncertainty

The cheetah was declared extinct in India in 1952. In September 2022, eight cheetahs from Namibia were released into Kuno National Park in Madhya Pradesh, followed by twelve from South Africa in 2023 and nine from Botswana in February 2026 ("Kuno National Park Receives"). By the programme's four-year review in September 2026, India's cheetah

population stood at 52, including 32 animals born in the country ("52 Cheetahs and Counting"). Cubs born to an Indian-born mother mark a genuine milestone.

The project has also drawn serious scientific criticism, particularly over early mortality, the limited size of available habitat, and whether the funds might achieve more if spent restoring the degraded grasslands that many species share. Its long-term value will depend on whether it can support a free-ranging, self-sustaining population across a connected landscape rather than one that relies on close management.

6.3 The Great Indian Bustard and the green-versus-green dilemma

The Great Indian Bustard, a large grassland bird, is listed as Critically Endangered, with fewer than 150 individuals estimated to remain, most of them in the Thar Desert of Rajasthan (BirdLife International). A leading cause of death is collision with overhead power lines, many of which serve solar and wind projects. In 2021 the Supreme Court of India ordered that lines in priority habitat be moved underground; in March 2024 it modified that order after the government raised concerns about cost and feasibility, and in the same judgment recognised a right against the adverse effects of climate change (M. K. Ranjitsinh). The case captures a dilemma that will recur worldwide: the clean-energy transition is essential for biodiversity in the long run, but its infrastructure can push individual species over the edge in the short run unless it is carefully sited.

6.4 Traditions of community conservation

India also has deep traditions of community conservation. The Bishnoi community of Rajasthan has protected blackbuck and khejri trees for centuries; the Chipko movement of the 1970s saw villagers in the Himalaya embrace trees to stop logging; and in Khonoma, Nagaland, a village that once depended on hunting declared its forests a community sanctuary in the late 1990s. The Forest Rights Act of 2006 gave legal recognition to the claims of forest-dwelling communities, although its implementation remains uneven. These examples suggest that the most lasting protection often grows from local ownership rather than external enforcement alone.

7. Challenges and the Way Forward

Several challenges cut across the global and Indian experience. The first is finance: conservation budgets remain small compared with subsidies that drive habitat loss. The second is monitoring. Countries cannot manage what they do not measure, and data on invertebrates, plants and freshwater systems remain thin. The third is human–wildlife conflict, which is growing as protected populations recover and human settlements expand. Compensation that is quick and fair, early-warning systems, and land-use planning that keeps corridors open are more effective than punishment after the fact.

The fourth challenge is connectivity. Isolated reserves become genetic islands, and a warming climate will force many species to move. Linking habitats across private and community land will require incentives, not just regulation. Finally, biodiversity has to be built into the decisions of sectors that rarely think of themselves as environmental, especially agriculture, infrastructure, energy and finance.

The world has been here before: none of the twenty Aichi Biodiversity Targets set for 2020 was fully met (Secretariat of the Convention on Biological Diversity), which is why the new framework puts so much weight on review and accountability. The CBD's COP17, to be held in Yerevan, Armenia, from 19 to 30 October 2026, will conduct the first global review of progress on the Kunming-Montreal framework (Convention on Biological Diversity, "UN 2026 Biodiversity Conference"). Early indications are mixed: 162 Parties have aligned national targets with the framework, yet fewer than half report being on track for any single target (AlterCOP). The gap between commitment and delivery is where the future of much of the world's wildlife will be decided.

8. Conclusion

The evidence reviewed here supports two conclusions that can sit uneasily together. Biodiversity is in steep and continuing decline, driven mainly by how humanity uses land and sea. Yet conservation, when it is well funded, scientifically grounded and supported by the people who share space with wildlife, clearly works. India's tigers, the world's green turtles and many smaller, less publicised recoveries show that the trend can be bent.

The task for the coming decade is less about inventing new goals than about meeting existing ones. That means protecting habitat that is genuinely effective and connected, sharing the costs and benefits of conservation fairly with local communities, and treating nature as the foundation of the economy rather than a line item within it. The species we lose in the next few decades will not come back. The choices that decide which ones remain are being made now.

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