THE BLIND SPOT IN CORPORATE BIODIVERSITY STRATEGY

Why Domesticated Animal Genetic Diversity Loss Is a Material Risk —
Hidden in Plain Sight

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Executive summary

The biodiversity disclosure frameworks now shaping corporate reporting are measuring biodiversity — but not all of it. The global policy architecture now recognizes domesticated animal genetic diversity as integral to biodiversity. The science has documented its erosion for decades. Yet it remains structurally absent from corporate biodiversity disclosure and biodiversity credit frameworks. This is not a gap at the edges of biodiversity governance. It is a gap at its foundation — in the biological infrastructure that underlies global food system stability. This paper identifies the gap, explains how it was created, and makes the case that the tools to close it are already in hand.

OPENING

The 2019 Global Assessment of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) — drawing on data from the Food and Agriculture Organization (FAO) — reported that by 2016, 559 of the 6,190 documented domesticated mammal breeds used for food and agriculture, approximately 9%, were classified as extinct, with at least 1,500 more currently threatened (IPBES, 2019, citing FAO, 2015). The Assessment explicitly documented the loss of "local varieties and breeds of domesticated plants and animals" within its findings — alongside the collapse of wild species populations. If a corporation discovered it had lost 9% of a critical asset base — with another significant share at imminent risk — the board would convene an emergency governance review. Yet domesticated animal genetic diversity, despite being explicitly recognized in the most comprehensive global assessment of biodiversity and ecosystem services to date, remains conspicuously absent from corporate ESG frameworks, biodiversity disclosure requirements, and nature-positive strategy documents.

The science made the case two decades ago. In February 2026, the IPBES Business and Biodiversity Assessment confirmed that biodiversity decline constitutes a systemic financial risk. The translation into corporate disclosure frameworks has still not followed. That gap is now a material risk.

SECTION 1 — THE SCALE OF WHAT IS AT STAKE

A Loss That Cannot Be Undone

Before assessing how governance systems might respond, it is necessary to establish precisely what is lost when a livestock breed disappears. The answer is not marginal — it is structural. Genetic resources are necessary for farming to respond to present and future needs. The diversity contained in heritage breeds represents what livestock conservation specialist

Professor Stephen J.G. Hall describes as 'summed evolutionary history' — adaptive traits refined across millennia that cannot be reconstructed once a breed is gone. Where that diversity is maintained, it provides the flexibility to respond rapidly to changing conditions. When it is lost, that flexibility is permanently withdrawn from the system.[1]

FAO's Domestic Animal Diversity Information System (DAD-IS) currently documents more than 8,800 breeds across approximately 40 species and 182 countries. The losses already recorded in the 2019 IPBES Global Assessment are not projections or risk scenarios. They are confirmed and irreversible.

In the language of corporate governance: a significant share of the biological capital underpinning global livestock production is being permanently impaired — without disclosure, without valuation, and without compensation.

This is not a conservation abstraction. It is a measurable erosion of adaptive capacity at the food-system level.

The extinction of a breed is not the loss of a niche asset. It is the permanent removal of adaptive options from the global food system.

SECTION 2 — HOW WE GOT HERE

The Architecture of Genetic Concentration

Since February 2022, highly pathogenic avian influenza has swept through U.S. commercial poultry operations in recurring waves, ultimately affecting more than 168 million birds across all 50 states — the most severe animal disease outbreak in U.S. history (Congressional Research Service, 2025, citing USDA-APHIS). Retail egg prices rose 53% year-over-year by January 2025 (Bureau of Labor Statistics, CPI data). The U.S. government committed $1.811 billion in emergency response costs. Eighty trading partners imposed trade restrictions on U.S. poultry exports — ten imposing national bans, fifteen applying state-level restrictions, and fifty-five applying county-level restrictions. State-level trade restrictions were associated with a 60% decline in real U.S. poultry export value compared to periods without restrictions in place (Padilla, Baker and MacLachlan, 2025). The full economic cost has not been calculated.
This did not happen by chance. The scale of disruption happened as a consequence of design. The global food system has become more concentrated, more uniform, more industrial, and more exposed. The next agricultural disease outbreak is not a question of whether. It is a question of when — and whether the economic disruption will find systems better prepared than the last time.

Industrial agriculture was engineered to optimize output under controlled conditions. High-performing breeds — Holsteins for dairy production, Cornish Cross for broiler chickens, and a limited number of highly selected commercial pig lines — were selectively developed and disseminated globally over the twentieth century. They are extraordinarily productive in the environments built for them: climate-controlled housing, standardized feed, antibiotics, growth regulators, anthelmintics intervention, and tightly managed breeding systems. But their performance is achieved through intensive selection for a narrow set of traits — growth rate, feed conversion efficiency, product yield, carcass uniformity. Over time, this process concentrates production in genetically similar populations derived from a small number of breeding lines. The result is structural genetic concentration: a significant share of global poultry

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[1] Hall, S.J.G. (2004). Livestock Biodiversity: Genetic Resources for the Farming of the Future. Blackwell Publishing, Oxford. ISBN 0-632-05499-9 DOI:10.1002/9780470995433 The citations in this paragraph draw on pp. 45, 148, and 77 respectively.

meat, dairy, pork, and increasingly beef production now depends on a limited number of highly selected commercial breeds and breeding lines.

FAO's analysis identifies the marginalization of traditional breeds — and the communities that developed and maintained them — as the primary driver of diversity loss. Locally adapted breeds — those carrying resistance to endemic disease, tolerance of climatic extremes, and the ability to thrive on marginal forage — were systematically displaced by the economics of intensification. The more consolidated production became, the less visible their adaptive value appeared — until the system encountered stress.

The U.S. avian influenza crisis was a preview. A single viral outbreak moving through a genetically uniform production system had few biological barriers to slow its spread. Supply collapsed across an entire commodity category.

The COVID-19 pandemic taught corporate governance what supply chain concentration costs. Livestock genetics is the same lesson, written in biological rather than logistical terms — with one critical difference:

When genetic diversity is lost, there is no alternative supplier to call.

SECTION 3 — RESILIENCE CAPITAL
What Genetic Diversity Actually Does

In a system engineered for efficiency, genetic homogeneity can appear rational — so long as environmental conditions remain stable. But when disease dynamics shift, climate volatility increases, or forage systems destabilize, uniformity becomes exposure.
Locally adapted breeds carry traits shaped by long-term selection in specific natural environments: resistance to endemic parasites and pathogens, tolerance of heat or cold extremes, the ability to maintain productivity on marginal forage, and reproductive performance under stress conditions. These are not vestiges of a pre-industrial agricultural past. They are adaptive capacities accumulated across thousands of years of environmental interaction — traits shaped by drought cycles, disease pressures, and landscape conditions that no breeding program can reconstruct on demand.

The practical value is documented. Thermotolerance and high-altitude adaptation traits from criollo and Tibetan cattle breeds have been successfully introgressed into commercial populations to sustain productivity under changing conditions (Hansen, 2020; Lyu et al., 2024). The Garole sheep of India's Sundarbans delta — whose breeding tract falls entirely within the Coastal Saline Zone of West Bengal — grazes in knee-deep water on saline-tolerant vegetation and maintains productivity under low-input conditions in one of the world's most climate-vulnerable coastal ecosystems (Sahana et al., 2001; Banerjee et al., 2011). Adaptive traits accumulated through centuries of environmental selection represent a biological resource whose value becomes visible precisely when conditions change.

Ex situ gene banks are essential for safeguarding genetic material and providing insurance against total extinction. But a cryogenic sample preserves a biological sequence — not the adaptive system in which those traits, their interactions, and associated biodiversity of their microbiomes evolved. It cannot replicate the ongoing interaction between animal, landscape, disease environment, and human management that shapes adaptive performance over generations. Living populations remain indispensable to maintaining functional resilience.

What concentration removes is not simply variation — it is optionality. In capital markets, optionality under uncertainty is recognized as strategic value; in biological systems, that value is

embedded in genetic diversity. Genetic diversity functions as resilience capital: it produces no visible return during periods of stability, but when environmental volatility, disease pressure, or climate extremes increase, systems with greater adaptive diversity absorb shock more effectively. Systems built on narrow genetic foundations carry concentrated failure risk.
The February 2026 IPBES Business and Biodiversity Assessment identifies biodiversity decline as a critical systemic risk threatening the economy, financial stability, and human wellbeing (IPBES, 2026). Yet domesticated animal genetic diversity — a systemic risk of exactly this kind — is not identified as a disclosure category, dependency metric, or material risk factor for corporate reporting.

Unacknowledged in the most authoritative biodiversity assessment now in force, this blind spot is not a fringe problem. It is a governance failure.

SECTION 4 — WHAT THE FRAMEWORKS WERE BUILT TO SEE
The Architecture of Omission

Corporate biodiversity frameworks did not intentionally exclude domesticated animal genetic diversity in spite of their importance having been accepted by FAO since the late 1940s. Current frameworks were built at a particular moment in scientific and policy history, the architecture that most sustainability teams work within today tracing back to 1992 — the Rio Earth Summit and the establishment of the Convention on Biological Diversity (CBD). At that time, the urgent conservation priority was the protection of wild ecosystems and wild species. The institutional structures that followed — environmental ministries, biodiversity treaties, conservation NGOs — were designed accordingly. Corporate ESG tools developed decades later inherited that emphasis — as the architecture of the frameworks now shaping disclosure practice makes plain. In practice, this meant that domesticated genetic resources remained the responsibility of agriculture ministries and FAO, while biodiversity governance — and the funding, databases, and expert communities that followed — was built around wild species and wild ecosystems. Corporate disclosure frameworks inherited that divide.

The 2019 IPBES Global Assessment explicitly named breed loss within its findings — alongside the collapse of wild species populations. The 2022 Kunming–Montreal Global Biodiversity Framework (KMGB Framework) includes commitments to agrobiodiversity and biocultural diversity. SDG Target 2.5 establishes measurable indicators for the genetic diversity of farmed and domesticated animals. The policy architecture now recognizes domesticated animal genetic diversity as integral to biodiversity.

This continuity is visible in specific landscapes. Many breeds are intimately associated with particular landscapes and agroecosystems yet history tells us that over and over again, breeds originally associated with a specific and often small geographic region have genes that proved to be of global significance. For example, the cattle of the tiny islands of Jersey and Guernsey; Indian/Cornish Game and White Leghorn chickens (principal ancestors of modern meat and egg poultry); the famously prolific Meishan pigs of China – all these were once purely local breeds which might have been thought irrelevant to modern food production. Remove the breed, and the loss is not limited to a genetic archive. An adaptive ecological function disappears with it – and that adaptive function may be of massive potential value somewhere else in global agriculture.

When a wild species declines, it triggers conservation response, funding, and disclosure requirements. When a breed disappears, it registers nowhere in the financial and disclosure frameworks now being built to account for nature. The distinction is not biological. It is entirely institutional.

That integration gap is visible in the most widely adopted biodiversity disclosure standard now in effect. Applying the ecosystem services vocabulary that Global Reporting Initiative (GRI) 101 uses to assess biodiversity impacts: heritage breeds provide provisioning services through food production under stress conditions, regulating services through disease resistance and climate adaptation, and cultural services through the biocultural knowledge systems that sustain their management (Hall, 2019). GRI 101 does not apply this framework to domesticated animal genetic diversity. These are not theoretical contributions. They are documented adaptive functions that the standard's own categories could recognize — and currently do not.[2]

The science has evolved. The policy commitments are in place. What remains is the integration of domesticated animal genetic diversity into the disclosure and governance systems that allocate capital.

SECTION 5 — WHO ACTUALLY HOLDS THIS DIVERSITY

The Stewardship Economy

Understanding where domesticated animal genetic diversity resides is essential to closing the governance gap.

FAO's global assessments of animal genetic resources consistently document that the majority of the world's remaining local livestock breeds are maintained not by industrial producers, gene banks, or corporations, but by smallholder farmers, pastoralists, Indigenous peoples, and local communities. These stewards are the custodians of much of the world's animal genetic diversity, maintaining it through daily husbandry practice rather than through formal conservation institutions (FAO, 2007). They are joined by nonprofit conservation organizations, research institutions, and in some cases government programs that maintain critically endangered breeds under structured genetic management and in many cases foster marketing initiatives, restoring threatened breeds to economic viability.

The 2019 IPBES Global Assessment provides broader ecological context. At least one quarter of the global land area is traditionally owned, managed, used, or occupied by Indigenous peoples, with additional areas managed by local communities. Approximately 35% of formally protected areas and 35% of terrestrial areas with very low human intervention fall within Indigenous-managed territories. IPBES further reports that biodiversity is declining significantly less rapidly in areas managed by Indigenous peoples and local communities than elsewhere.
In livestock systems, this stewardship takes a specific form. Several hundred million pastoralists operate across all continents, managing rangelands that cover between one third and one half of the Earth's terrestrial surface — landscapes where crop production is often not viable and where locally adapted breeds are the only functioning agricultural model (Blench, 2001; FAO, n.d.; UNCCD, 2024).

These communities and producers constitute, in effect, the world's largest in situ genetic conservation network. It operates through production systems, not conservation budgets. It is embedded in livelihoods, not funded as infrastructure.

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[2] GRI 101's Disclosure 101-3 references genetic resources through the Nagoya Protocol on Access and Benefit-Sharing. The disclosure applies to organizations conducting research and development on the genetic or biochemical composition of resources — including those active in cosmetics, pharmaceuticals, and agriculture. Livestock breed conservation does not constitute utilization of genetic resources in the R&D sense the Nagoya Protocol defines, and generates no disclosure obligation under Disclosure 101-3. The result is that domesticated animal genetic diversity falls outside both GRI 101's ecosystem services assessment and its genetic resources governance provisions.

Yet the resilience value created by this stewardship is largely uncompensated. Global food supply chains, insurance markets, and agricultural finance systems benefit from the adaptive capacity preserved in these breeds. The economic systems that depend on that resilience rarely recognize or directly support the stewards maintaining it.

IPBES is explicit that Indigenous and local knowledge systems are under increasing pressure. Where stewardship becomes economically unsustainable, it contracts. When it contracts, breeds disappear — not into archives, but from living populations.

Alongside pastoral and community systems, individual conservationists, family operations, and nonprofit organizations maintain critically endangered breeds in populations sometimes numbering only in the dozens globally. These represent the final viable breeding populations of distinct genetic lineages. Their survival often depends on personal commitment rather than structured economic support.

The full spectrum of in situ conservation — from pastoral systems managing diversity at landscape scale to organizations safeguarding the last remaining populations of rare breeds — constitutes a biological infrastructure that modern biodiversity finance to date has failed to recognize or value.

SECTION 6 — WHAT GENE BANKS CANNOT PRESERVE
The Biocultural Dimension

IPBES defines biocultural diversity as the diversity exhibited by interacting natural systems and human cultures — encompassing the links between biological diversity and the knowledge systems, practices, and cultural memories that have co-evolved with it. The CBD's KMGB Framework explicitly targets the maintenance and restoration of genetic diversity within and between populations of domesticated species (Target 4) — acknowledging that domesticated genetic resources are embedded within human stewardship systems. In livestock systems, this relationship is direct and observable (Hall, 2019).

In arid regions of Rajasthan, India, Raika pastoralists developed camel breeding systems aligned with desert mobility and drought endurance — selecting animals capable of long-distance travel under extreme water scarcity (FAO, 2009). In subarctic Scandinavia and Finland, Sámi reindeer herding practices evolved in synchronization with migratory grazing patterns, snowpack conditions, and seasonal variability (FAO/Bioversity International/CIAT, 2021). These are not isolated cultural anecdotes. They are examples of long-term ecological selection operating through human management.

Biocultural value, however, extends beyond ecological knowledge embedded in production. Heritage breeds are also bearers of cultural memory — present in ceremony, festival, poetry, visual art, and civic life — in ways that persist long after their agricultural utility has diminished or disappeared entirely. The Burro de Miranda of northeastern Portugal's Terra de Miranda region illustrates this directly. For centuries the breed was the agricultural and economic foundation of the region — its work capacity, its unique physical characteristics adapted to isolated highland terrain, and its place at the center of trade fairs called feiras de burros shaped the social fabric of Mirandesa communities. Mechanization ended its productive role, but not its cultural one. An annual July festival continues to trek the donkeys through local villages accompanied by traditional gaita-de-fole bagpipe players — a living performance of a human-animal relationship that long outlasted the animal's economic role (AEPGA, n.d.; Quaresma et al., 2015). No gene bank preserves a festival. No cryogenic repository holds the identity of a community that organized its calendar, its trade, and its artistic expression around an animal. Nor does any frozen sample capture the epigenetic record a living breed carries — the biological imprint of centuries spent in one specific landscape — or the coadapted microbiomes that develop through generations of interaction between an animal population, its forage, its soil, and its disease environment.

This dimension of heritage breed value falls squarely within SDG 11.4's mandate to protect cultural and natural heritage. SDG 11.4 speaks of collections — a term that may not immediately call to mind a living animal. But the objection dissolves under scrutiny. FAO's own framework for in situ conservation of animal genetic resources uses collection language explicitly; a living gene bank is by definition a biological collection held in trust, curated across generations by pastoral communities operating as its stewards. Heritage breeds are not incidentally connected to cultural heritage — they are among its most irreplaceable expressions, carrying genetic information that no museum object, archive, or digital record can substitute. The breed and the culture that shaped it are a single collection. That collection is currently unprotected by every major corporate biodiversity disclosure framework in use. Across marginal landscapes — deserts, tundra, uplands, savannas — locally adapted breeds persist because knowledge systems have co-evolved with ecological constraint. That knowledge is experiential: which animals survived drought, which resisted disease, which could reproduce under nutritional stress. It is transmitted through practice across generations — not codified in breeding manuals, nor recoverable from genomic sequence data alone.

When a breed disappears, the loss cascades — from the genetic architecture lost immediately and irrecoverably, to the stewardship knowledge lost within a generation as practice ceases, to the cultural identity that persists longest but gradually loses its living referent, until what remains is representation rather than relationship.

A stored genome is a biological archive. A living population is an adaptive system.

The IPBES Transformative Change Assessment 2024 identifies disconnection from nature and erosion of knowledge systems as drivers of biodiversity loss. In livestock systems, genetic erosion and knowledge erosion frequently occur together.

The structural reality is unavoidable: where stewardship systems become economically unviable, both breeds and knowledge systems decline. Rising land values, tenure insecurity, and competing land uses are among the primary drivers displacing pastoralists and smallholder farmers from the landscapes where locally adapted breeds evolved — a pressure documented across marginal ecosystems globally and increasingly in developed economies as well. Supporting and conserving these systems is not simply a matter of capital injection. Where decline has already occurred, restoration requires more than reintroducing animals — it requires recovering the land access, management knowledge, and economic conditions under which breeds and the people who steward them can function together. Prevention is categorically less costly than recovery.

Conserving domesticated animal genetic diversity, therefore, is not solely a biological intervention. It is the preservation of adaptive systems that operate at the intersection of ecology and culture — systems that become progressively harder to recover the further decline advances, and that cannot be reconstructed once the breed, the knowledge, and the cultural relationship have been fully severed.

The moment conservation becomes only an archive, it ceases to function as an adaptive system.

SECTION 7 — WHY THE SCIENCE HAS NOT REACHED GOVERNANCE

The Institutional Silo

The institutional divide was not incidental. Following the 1992 Rio Earth Summit, wild biodiversity and domesticated genetic resources were assigned to entirely separate governance tracks — environment ministries and the CBD on one side, agriculture ministries and FAO on the other — each operating with separate databases, funding streams, expert communities, and reporting frameworks. Each system evolved coherently within its own mandate. What did not evolve was a structural bridge between them.

In 2004, Hall wrote that "agricultural policy makers will be seen by future generations as having abdicated their responsibilities if they fail to support conservation of livestock biodiversity" (Hall, 2004, Introduction, p. x).

The 2026 IPBES Business and Biodiversity Assessment confirmed that biodiversity decline constitutes a critical and pervasive systemic risk to the global economy — a conclusion two decades in the making (IPBES, 2026). The scientific signal has been consistent. The integration challenge is institutional.

This separation remains visible in global targets. SDG Target 2.5 — the only internationally agreed metric explicitly tracking the genetic diversity of farmed and domesticated animals — sits under SDG Goal 2 (Zero Hunger), not Goal 15 (Life on Land). Corporate biodiversity strategies built primarily around Goal 15 indicators may never encounter it.

The Taskforce on Nature-related Financial Disclosures (TNFD) and related disclosure frameworks reflect the architecture they inherited. They were not designed to exclude domesticated animal genetic diversity. They were designed within an institutional architecture that treated domesticated animal genetic diversity as an agricultural concern rather than a biodiversity and financial risk concern.

The result is not denial. It is omission by institutional inheritance.

FAO has maintained a decades-long record of advocacy for livestock genetic conservation. Funding flows have remained limited relative to the scale of the resource at risk. The science has been present. The governance bridge has not.

This is not a failure of knowledge. It is a structural misalignment between biodiversity science and capital governance systems.

SECTION 8 — FROM OMISSION TO INTEGRATION

Genetic Resilience as Infrastructure

The frameworks that currently govern corporate biodiversity disclosure inherited a definition of biodiversity that stops at the boundary between wild and domesticated. Heritage breed conservation exposes the cost of that boundary more clearly than almost any other case. These animals emerged from nature, have shaped the landscapes we now seek to protect, and carry biological diversity that no wild ecosystem can replicate — yet they are classified as agricultural outputs for purposes of biodiversity accounting. Nature drew no such boundary. Human institutions did.

Heritage breeds are not agricultural commodities that happen to be old. They are living repositories of adaptive genetic information accumulated across millennia of selection in specific environments — information that cannot be recovered once a population is lost, cannot be fully captured in a frozen sample, and cannot be replicated by any commercial breeding program. By any biological measure, they are biodiversity. Current disclosure frameworks do not recognize them as such — not because the science is ambiguous, but because the operational definition of biodiversity used in those frameworks was shaped by institutional boundaries drawn three decades ago. The result is a measurement architecture that can see a wild bird in a hedgerow but cannot see the heritage breed maintaining that hedgerow through its grazing. Both are biodiversity. Only one is currently perceived as worthy of conservation, under these frameworks.

The architecture to correct this already exists. The CBD now recognizes genetic diversity within domesticated species as a formal conservation target under the KMGB Framework. FAO maintains DAD-IS as a global monitoring platform. IPBES has framed biodiversity decline as a systemic financial risk to the global economy. The TNFD provides a structure for nature-related risk disclosure. Recognition exists at the framework level. What is missing is the translation layer that makes domesticated animal genetic diversity legible to corporate biodiversity strategy and capital allocation.

Domesticated animal genetic diversity must be treated not as philanthropy, not as offset, but as resilience infrastructure. Modern economies already recognize infrastructure categories essential to stability — energy grids, water systems, digital security architecture. These systems do not exist to generate short-term return on investment. They exist to prevent systemic disruption. Domesticated animal genetic diversity functions in precisely this way. Between-breed diversity preserves adaptive traits that buffer disease exposure, climatic volatility, and ecological instability. It maintains option value under uncertainty. It operates as distributed biological redundancy embedded within food systems — with one distinction that separates it from every other infrastructure category: it cannot be rebuilt after collapse.

The U.S. avian influenza crisis was not an anomaly. It was a signal. That vulnerability exists wherever genetic uniformity concentrates exposure faster than adaptive diversity can respond. The governance challenge is therefore preventive, not reactive.

When the TNFD released its final recommendations in 2023, it signaled that nature-related risk disclosure was moving from voluntary to expected. Heritage breed conservation does not need to wait for that trajectory to reach mandate. It needs to enter it — at the moment when voluntary corporate adoption is accelerating demand for standardized, auditable biodiversity data.

Conclusion

The distinction between wild biodiversity and domesticated animal genetic diversity is not scientific. It is institutional — and it is costing us breeds we cannot recover. The governance frameworks that should logically encompass it have been built. The capital mechanisms to sustain it are emerging. What has been missing is the operational infrastructure that connects them — the translation layer that makes a living gene bank legible to a corporate sustainability strategy, a supply chain risk assessment, or a nature-related financial disclosure.

That infrastructure exists. Organizations such as World Heritage Animal Genomic Resources are managing living populations of critically endangered heritage breeds under active genetic monitoring, gene banking, structured population reporting, and governance-aligned documentation — demonstrating that the model is viable not as theory but as practice. The dual model — living populations maintained in situ that continue to evolve within their ecosystems, supported by ex situ preservation — safeguards both biological material and the adaptive systems that give that material meaning.

The corporate sustainability officer reading this paper operates within frameworks that were not designed to see this asset class. That is not a permanent condition. It is a gap in a system that is actively evolving — and the organizations, investors, and policy makers who close it first will define how biological resilience is valued in the next decade of nature-related finance.

The question is not whether heritage breed conservation belongs within corporate biodiversity strategy. The science settled that. What is not clear is how many breeds will go extinct before institutions act.

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