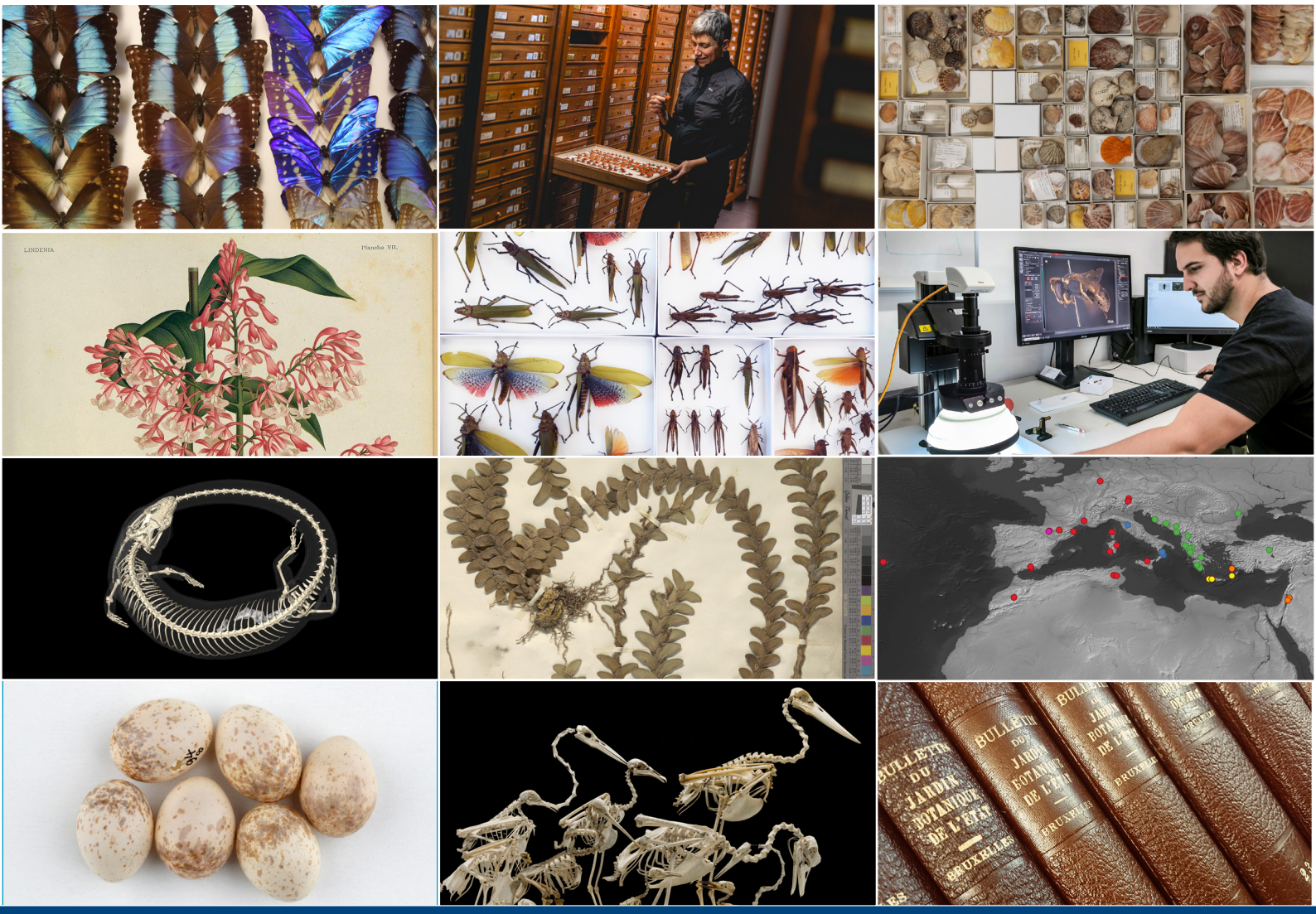
IUCN SSC Species Survival Commission

Position Statement

On the vital role of biological collections - such as those in natural history museums, herbaria, fungaria and other repositories - in biodiversity conservation



POSITION STATEMENT ON THE VITAL ROLE OF BIOLOGICAL COLLECTIONS - SUCH AS THOSE IN NATURAL HISTORY MUSEUMS, HERBARIA, FUNGARIA AND OTHER REPOSITORIES - IN BIODIVERSITY CONSERVATION

Millions of preserved specimens in the world's natural history museums, herbaria, fungaria and other bio-repositories represent an irreplaceable library of life on Earth, providing the foundational evidence for discovering species, understanding evolutionary processes, and documenting and protecting the planet's biological heritage. The IUCN Species Survival Commission (SSC) recognizes that Natural History Museum Collections (NHMCs) are not merely repositories of the past but are dynamic, research-active infrastructures critical for addressing contemporary and future global challenges. In particular, they are essential for supporting taxonomy, the scientific discipline which provides the universal naming system, without which a species cannot be protected, and are pivotal in conservation planning, disease surveillance, climate change research, and the documentation of extinction. However, the crucial role of NHMCs is often under-valued and their potential under-supported. The purpose of this document is 1) to outline SSC's position on the indispensable roles played by NHMCs in species conservation and scientific discovery, 2) to urge governments, universities, and agencies to prioritize and fund these collections as critical scientific infrastructures, and 3) to encourage the global conservation community to fully integrate the resources and expertise of NHMCs into a collaborative strategy to reverse biodiversity decline.

Citation: IUCN SSC 2026. ***Position Statement on the vital role of biological collections - such as those in natural history museums, herbaria, fungaria and other repositories - in biodiversity conservation***. IUCN Species Survival Commission (SSC), Gland, Switzerland. 13 pp.
Available at: IUCN SSC Resources.

Cover: From top to bottom, left to righ: 1. Butterfly specimens of the genus *Morpho* (Lepidoptera: Nymphalidae) by F. Andreone; 2. Collection technician in the deposits of MUSE by MUSE – Science Museum, Trento; 3. Mollusk (Bivalvia) specimens by J. Giribet / Museum of Comparative Zoology, Harvard University / ©President and Fellows of Harvard College; 4. Drawing of *Epidendrum paniculatum* (Asparagales: Orchidaceae) by P. De Tollenare from "Lindenia: Iconographie des orchidées", vol. 1, 1885 / Meise Botanic Garden; 5. Grasshoppers (Orthoptera) from the historical African collections at the Museu Nacional de História Natural e da Ciência, Universidade de Lisboa by R. A. Keller; 6. Specialized imaging of specimens held in scientific collections forms by R. A. Keller; 7. *Amphiglossus reticulatus* (Squamata: Scincidae) from the herpetological collection at the Museo Regionale di Scienze Naturali, Torino by R. Boistel; 8. Herbarium specimen of *Angraecum aporoides* (Asparagales: Orchidaceae) by Meise Botanic Garden; 9. Distribution of genetic lineages of the *Oedipoda germanica* group by A. Hochkirch; 10. Clutch of *Lanius collurio* (Passeriformes: Laniidae) by P. Rozsíval / Vlastivědné Muzeum v Olomouci; 11. Bird skeletons by J. Giribet / Museum of Comparative Zoology, Harvard University / ©President and Fellows of Harvard College; 12. Bulletin du Jardin botanique de l'Etat à Bruxelles by Meise Botanic Garden.

Acknowledgements: This document is the result of a deeply collaborative and iterative distributed public consultation overseen by Franco Andreone, Spartaco Gippoliti, Edgard Yerena, Kira Mileham, Mayerlin Ramos, Nicole Duplaix, and Jon Paul Rodriguez. Input came from numerous individuals and working groups, the SSC Steering Committee and a selected panel of museological experts. This feedback and the team's reactions are available upon request to SSC@iucn.org.

Final layout: Liliana Medina-Toro

SSC's position

The IUCN Species Survival Commission (SSC) underscores the crucial importance of biological collections in documenting, studying, and preserving Earth's biodiversity.

Housed primarily in natural history museums and other academic institutions, these collections serve as an invaluable historical record of life, containing a diverse range of biological materials. This includes voucher specimens - such as dried, pressed, stuffed, or preserved botanical, fungal, and zoological organisms - as well as artefacts, acoustic recordings, photographs, digital media, tissue samples, and genetic material.

Each component is vital for piecing together the past, understanding the present, and forecasting the future of species and ecosystems. By grounding scientific research in verifiable evidence, the collections provide an indispensable foundation for inquiry and conservation strategy.

By collaborating with zoos, aquariums, breeding centers, biobanks, seed banks, and microbial culture collections, biological collections form a powerful network that integrates *in situ* and *ex situ* efforts to conserve the world's animals, plants, and fungi. This network ensures the conservation of these species both now and for generations to come.

Rationale

Taxonomy and collections as basic conservation tools

The IUCN Species Survival Commission (SSC) recognizes the crucial role of biological collections, usually housed in public and private natural history museums, academic institutions, and repositories. These collections are referred to here as Natural History Museum Collections (NHMCs) and comprise a global network of preserved specimens, related metadata and digitized information, spanning all life science disciplines, including zoology, botany, palaeontology, microbiology and anthropology. When integrated and coordinated across disciplines, such a network generates crucial data and supports collaborative and globally planned research. This work spans the entire life sciences spectrum, including biodiversity discovery, description, and conservation. Furthermore, it supports vital applications such as ecological services, health surveillance, pandemic monitoring, agricultural production, and invasive species control. This forms the foundation for addressing national, international, and global challenges to the existence of life on Earth.

Biological collections also play a critical role in underpinning and advancing taxonomy - the scientific discipline of identifying and describing new species, resolving evolutionary processes and patterns, and determining species boundaries. They house precious reference materials, including type specimens (specimens associated with a scientific name, which serves as the objective standard of reference for the application of that name), creating extensive digital biodiversity data collections (Hilton et al., 2021; Ball et al., 2025a; Koblitz et al., 2025). Typical materials are the primary venues for taxonomic descriptions, where new species are identified and described using integrative methods, and where crucial revisions of taxonomic boundaries are performed (Prather et al., 2004; Bebber et al., 2010; Goodwin et al., 2015; Grace et al., 2021). Taxonomic research based on natural history collections is crucial for reducing the discovery and description gap (Löbl et al., 2023) and for identifying taxa that are new to science.

Taxonomy provides a universal, stable and unambiguous system of reference that facilitates communication across disciplines, informs policy and inspires conservation initiatives worldwide (Shaffer et al., 1998; Thompson et al., 2021; Johnson et al., 2023; Miralles et al., 2024; Gippoliti et al., 2024), establishing species description as a cornerstone of biological conservation. Only formally named species can be assessed for inclusion in the IUCN Red List of Threatened Species or in international or national conservation legislation, whereas undescribed taxa cannot be protected under existing frameworks and may face extinction without ever being recognized by science (Costello et al., 2013). Only around two

million of the estimated eight-nine million species of animals, fungi, plants and microorganisms on Earth have been formally described (Mora et al., 2011; Wiens, 2023). However, recent projections suggest that the actual number could be much higher, ranging from 563 million to 2.2 billion species when accounting for cryptic species (Li & Wiens, 2023). Taxonomy is also crucial at the ecosystem level because the effective assessment, monitoring and conservation of ecosystems requires comprehensive knowledge of species composition, including native elements (IUCN, 2016), which is often only possible by examining biological collections. The voucher specimens housed in these collections are indispensable for assessing historical genetic diversity - a core pillar of biodiversity alongside species and ecosystem diversity.

The IUCN SSC strongly encourages its conservation partners, including government agencies, to support the creation and management of biological collections as part of a global collective effort to discover, document, and preserve species and their natural habitats, and to foster a competent workforce skilled in essential taxonomic work. It is imperative that the activities conducted within NHMCs are integrated into regional, national, and global biodiversity conservation strategies as a foundational component of all conservation planning. Indeed, the continuous surveying and documentation of biodiversity through the collection and preservation of voucher specimens is one of the primary responsibilities of NHMCs. This process is crucial for ensuring the reproducibility of biodiversity science and safeguarding long-term scientific integrity. The ongoing study of preserved specimens (including prokaryotes, unicellular eukaryotes, animals, fungi and plants) held in biological collections is crucial for understanding evolutionary and biogeographical phenomena, particularly in the context of current anthropogenic changes to the Earth (Ball et al., 2025a).

The IUCN SSC further acknowledges the pivotal role of NHMCs as true hubs where researchers, educators, students, enthusiasts and other community members can meet and share knowledge and interests across a variety of disciplines. The intersection of interests and fields of study is one of the key impacts of biological collections on biodiversity conservation, which relies on an understanding of the full range of needs, challenges, and priorities. Those involved in a cross-disciplinary engagement who specialize in non-scientific disciplines play a significant role in disseminating these messages beyond scientific networks (Bakker et al., 2020). Overall, NHMCs do more than just preserve existing specimens: they are dynamic centers where ongoing biodiversity and changes are documented through new surveys, acquisitions, fieldwork and emerging technologies (Ocampo-Peñuela et al., 2025).

Studying and preserving biological collections in the long term is important for documenting and conserving natural diversity on a planetary scale. Museums and academic institutions must therefore make their collections accessible to the public and researchers in accordance with the FAIR principles (findable, accessible, interoperable, and reusable), which provide a framework for improving the management, sharing, and reuse of digital data. These principles ensure the accessibility of collections, including specimens and associated metadata (Wilkinson et al., 2016).

Collections and repositories host verifiable records of past and present biodiversity

The IUCN SSC recognizes the valuable role that museum collections play in conserving species and ecosystems, as well as their significant contribution to international capacity building, emerging as institutions that foster partnerships based on mutual respect and reciprocity (Gosliner & Burke, 2013; Arengo et al., 2017). Many NHMCs play a crucial role in transferring knowledge from the Global North, where they are often concentrated due to the historical legacy of western science, to biodiversity-rich regions. This practice is rapidly becoming the norm (Ball et al., 2025 b).

These efforts include training taxonomic experts from countries where species are found, supporting the description of new species in megadiverse countries, and offering specialised Red List assessment training to strengthen local conservation initiatives (Prathapan & Rajan, 2020). This is particularly pertinent given their function as repositories of the natural world. Through their preserved strains, specimens, and associated biological, physical, and historical materials and information, biological collections provide the primary verifiable record of past and present biodiversity. This serves as a baseline against which current biodiversity trends can be compared and understood. In line with the IUCN's policy on the sustainable use of organisms, the SSC supports the strategic and responsible collection of voucher specimens. IUCN SSC also encourages the creation of NHMCs in biodiversity rich countries lacking such facilities.

The IUCN Red List of Threatened Species often uses collections to support the IUCN SSC and other organizations in conducting global biodiversity evaluations. The understanding of biodiversity depends heavily on the records held in these collections. Specimens of plants, fungi and animals, collected at various times from different geographical regions, are vital for investigating the causes of biodiversity decline, including the impacts of climate change, overexploitation, invasive species, pollution, and other human-caused effects.

Collections are also essential for studying the spread of emerging diseases, including zoonoses (Dunnum et al., 2017; Colella et al., 2021; Thompson et al., 2021). Biological collections also play a pivotal role in documenting extinction processes in order to prevent future recurrences, building upon those amassed over the past three centuries (Hung et al., 2014). Although robust datasets are available for a few well-studied vertebrate groups (e.g., birds, mammals and reptiles), the vast majority of Earth's species remain poorly documented. Consequently, many species listed on the IUCN Red List are still classified as Data Deficient, including numerous neotropical freshwater fish species (Sayer et al., 2025) and insects (Cardoso et al., 2023).

Species discovery and description to warrant an efficient conservation

This document highlights the essential role of biological collections in advancing knowledge of, and conservation actions for, animal, fungal, plant, and microbial diversity. The IUCN SSC recognizes the unique vital support of biological collections for classifying species and acknowledges the significant contributions these collections make to conserving and understanding biodiversity, assessing the impacts of a changing planet on species, helping to protect against invasive species, and promoting the study of species interactions, ecosystem services, nutrition, bioactive compounds (for health and toxicity), air and water quality, and climate.The scientific relevance of NHMCs has progressively expanded. In an era characterised by dramatic environmental changes, accelerating rates of extinction, and almost unstoppable human impact on the world's biodiversity, many natural habitats are under serious threat, with an unknown number of species disappearing (Rocha et al., 2014; Andreone et al., 2024). According to Hochkirch et al. (2023), a quarter of species globally are at serious risk of extinction. Biobanks also play a critical role in this context: genetic diversity has decreased by up to 10% globally, and the collections of biological material are essential for filling knowledge gaps, alongside more collections of preserved specimens (Shaw et al., 2025; Exposito-Alonso et al., 2022).

The increase in taxonomic description concerns all major taxonomic groups, following distinct patterns across kingdoms. For plants, the rate of new species description is consistently high. Vascular plants show ongoing discovery rates with approximately 2,500 new species described annually (WCVP, 2025). Ferns show particularly high description rates, with over 1,200 new species identified since 2010 (Roskov et al., 2025). Cryptogams, including bryophytes and algae, reveal significant diversity, with around 500 new species reported each year. The fungal kingdom remains one of the most rapidly expanding areas of biodiversity research: current description rates approach 2,000 new species annually, yet available data suggest this represents less than 10% of total fungal diversity (Hawksworth & Lücking, 2017). Among invertebrates, insects show particularly notable growth. The Orthoptera order showed a 20% increase in described species between 2009 and 2025 (Cigliano et al., 2025). Some single publications document hundreds of new species simultaneously, with one study describing 403 new invertebrate taxa (Sharkey et al., 2021). Spider taxonomy maintains consistent progress, typically adding 800+ new species annually (World Spider Catalog, 2020). Vertebrate identification and description patterns also vary significantly. Fishes lead in absolute numbers (7,825 new species since 2006; Fricke et al., 2025), while amphibians show the highest relative growth - a 40% increase since 2005 (AmphibiaWeb, 2025). Even well-studied mammal groups continue to yield discoveries, with over 1,000 new species accepted since 2000 (Burgin et al., 2025), many through genetic analyses.

This steep species-identification trajectory is due to various factors, including the application of cutting-edge methods such as DNA and spectral analysis and machine learning, new field surveys, and the reanalysis of both historical and modern collections held in NHMCs (Schlick-Steiner et al., 2010; Funk, 2018; Davis & Knapp, 2024). These methods accelerate the discovery process, underscoring the unique contribution of natural history collections to resolving cryptic diversity and species complexes. Many of these studies would be impossible to conduct solely or primarily in the field, particularly for cryptic and morphologically complex species. NHMCs are especially valuable as they house voucher specimens and extensive associated data, such as habitat and ecological information, photographs, DNA vouchers, environmental DNA, field notes, computed tomography (CT) scans, radiographs, and cleared and stained specimens.

Natural history collections as libraries of a threatened nature

NHMCs and their associated data constitute genuine libraries of threatened species. The accumulation, study and appreciation of voucher specimens are fundamental to the museums' own operations, as their biological collections provide invaluable material for research (English et al., 2018; Gippoliti, 2018). Series of biological specimens collected from across the globe over almost three centuries have often proved crucial for investigating the effects of various contemporary issues. These include climate change, overexploitation, habitat degradation, the introduction of invasive species, pollution and other human-caused impacts, as well as the spread of diseases relevant to human health (Colella et al., 2021).
Although NHMCs are vast and increasingly accessible online such as through GBIF (the Global Biodiversity

Information Facility), expanding specimen-based collections remains important for ensuring reproducible science and continues to play an irreplaceable role (GBIF Secretariat, 2023). Detailed analysis often reveals significant taxonomic and temporal gaps in the number of available voucher specimens at a regional level (Jiménez-Mejías et al., 2024. This is particularly pertinent for natural sites threatened by human activity. In such cases, voucher specimens allow conservationists to confirm a species' historical presence in an area, identify threats and their impact, and conduct comparative analyses. The original voucher specimens and their associated information represent the physical source of the original data. Despite their proven value, NHMCs face criticism from some conservation circles, who allege that specimen collection is unnecessary or harmful. It is essential to recognize that contemporary collecting activities are conducted under strict ethical frameworks and regulations, usually requiring permits from relevant wildlife authorities. The collection of voucher specimens is a highly targeted and responsible practice. On the contrary, existing collections demonstrate that knowledge of taxonomic, geographic or temporal gaps, as well as contemporary sampling, is essential for documenting shifts in biodiversity (e.g., due to climate change or pollution) (Santos & Ceríaco, 2025).

The minimal and calculated impact of responsible collecting is vastly outweighed by its fundamental benefits: it provides the indispensable evidence base that allows us to describe, understand, and ultimately protect species from extinction. Similarly, taxonomy is not a static discipline, but rather a dynamic science integrating genomics, biogeography and conservation planning (Gippoliti et al., 2024; Miralles et al., 2024). The analysis of historical references, including those housed in biobanks, has also enabled researchers to address important ecological and epidemiological issues. For instance, these collections have helped establish whether elevated mercury levels in certain Atlantic Ocean fish are the result of recent human activity (Miller et al., 1972), and whether the virus responsible for the decline in koala populations in Australia was introduced by invasive species (Ávila-Arcos et al., 2013).

NHMCs often have specialized libraries dedicated to preserving taxonomic literature and historical archives, including field notebooks, correspondence and other documents directly related to specimens. The emphasis placed on archival material is usually greater than in other institutions, particularly with regard to historic scientific publications. These records never lose their relevance, as researchers consistently need to consult original descriptions, illustrations and notes in order to verify critical data. Archival documents, whether from pioneering scientists, field biologists or explorers, are crucial for accurately reconstructing collection sites and understanding past environmental conditions. They offer invaluable insights into how habitats existed decades or even centuries ago. Beyond their scientific utility, these collections constitute an essential part of our shared cultural and scientific heritage, preserving not only biological knowledge, but also the rich history of human exploration and discovery.

Facing underfunding and a plea for a continuative support

The collection, curation, and study of specimens operate on scales ranging from local to global. Despite their critical role, chronic underfunding threatens the ability of NHMCs to safeguard tangible evidence of a global biological heritage (Andreone et al., 2022; Rohwer et al., 2022). Administrative authorities and policymakers frequently fail to provide adequate support (Alberch et al., 1994; Andreone et al., 2014, 2022). Furthermore, universities often dismiss these collections as outdated relics rather than valuing them as vital scientific resources, consequently neglecting their responsibility to fund essential facilities and specialized staff (Erkens & Baas, 2008). In many cases, local administrations invest much more in expositive aspects, and less in augmenting and valorizing collections and associated field research. This happens frequently, particularly in small museums, which often face ongoing budget constraints (Andreone, 2015).

Collections are active research infrastructures that require stable budgets for curation, digitization, and capacity building like other conservation tools (Rodríguez et al., 2022). We urge governments, universities, and international agencies to prioritize NHMCs for biological conservation. This should include allocating dedicated funding for specimen preservation, data mobilisation and taxonomic training: without investment in biological collections, the irreversible loss of baseline data required to address the extinction crisis, zoonotic pandemics and ecosystem degradation will occur (Andreone et al., 2022; Rohwer et al., 2022). NHMCs should also be integrated into national biodiversity strategies and climate change adaptation plans. Promoting public - private partnerships increases their educational and conservation impact. Yet, the IUCN SSC recognizes their importance in supporting rigorous, long-term biodiversity studies is widely overlooked. It is imperative to recognize that NHMCs underpin all verifiable biological science, a role that persists regardless of technological advancements.

Collaborative network to coordinate conservation efforts

NHMCs and biobanks play complementary roles in biodiversity research. While NHMCs provide authoritatively curated specimens, biobanks specialize in preserving high-quality biological material, such as tissues, DNA

and parasites, under controlled conditions, making them indispensable for molecular studies. Biobanks have, for instance, facilitated research on ectoparasites from birds killed in window collisions and enabled collaborations with genomics laboratories to identify blood parasites in migratory birds. Once catalogued, these specimens become invaluable long-term resources, capable of supporting research projects that were unforeseen at the time of collection, decades later. Advances in molecular techniques now enable historical DNA to be extracted from voucher specimens, some of which are over 200 years old (Raxworthy & Smith, 2021). Similarly, herbaria and plant biobanks and seed banks are vital for studying preserved plant materials dating back 420 years (Erkens et al., 2008), which provides further documentation of ecological shifts in the Anthropocene.

The preservation of genetic variability in populations is becoming an increasingly important endeavor for many biological collections. To this end, collaboration between scientific collection institutions, aquaria, botanical gardens, zoos, and nature conservation organizations must be strengthened, and specialist genetic banks for threatened species must be established or reinforced (Wandeler et al., 2007; Poo et al., 2022; Johnson et al., 2023). Preserving ecological material in museum collections, such as the gut contents and parasites of roadkill, or samples obtained during necropsies of marine mammals found dead on shorelines, can provide unique records that may be crucial for protecting species in the future (Greiman et al., 2018; Galbreath et al., 2019). These materials facilitate a range of scientific comparisons (Rohwer et al., 2022; Charles & McKenna, 2024). Historically, this role has primarily been carried out by NHMC staff, who have generated invaluable data for conservation efforts.

Alongside actively collecting specimens, it is also important to adopt a holistic, scientifically grounded and ethical approach to collections, in order to continue strategically building this critical infrastructure (Miller et al., 2020; Hobson, 2023). To this end, NHMCs also preserve specimens obtained opportunistically, including those found dead, donated by partner organisations, zoological gardens or aquaria, confiscated by customs and law enforcement agencies. These specimens also serve as biological records, documenting threats or causes of death and providing critical conservation insights. Seized specimens intercepted by customs also inform wildlife biologists about which organisms are being illegally trafficked across borders (Wyler & Sheikh, 2008).

Finally, the importance of NHMCs in the identification, description and study of nature, as well as in the dissemination of scientific knowledge, must be fully recognized. Through their engagement with the public and collaboration with universities and research centres, NHMCs have become invaluable hubs for the promotion and guidance of scientific thinking. By working closely with these institutions, museums successfully combine popularization and entertainment with scientific rigor, creating a unique appeal. They provide vital support and reference material for enthusiasts and associations, and enable school-age children to engage directly with the natural world. This role is becoming increasingly important in an era dominated by social media and virtual experiences. NHMCs are often connected to exhibits focused on global change, with the mission of fostering “advocates for the planet”. Additionally, many NHMCs incorporate living displays - sections where live animals and plants complement traditional exhibits, blending static collections with dynamic biological elements. Nowadays, botanical gardens and zoological parks are often integrated into museum spaces, creating a synergy between preserved and living collections that enhances research and education.

Examples of the roles of biological collections, such as those in natural history museums, herbaria, and fungaria

Here we provide a non-exhaustive list of examples where biological collections, such as those in natural history museums, herbaria, fungaria and other repositories, contribute or can be further called upon to fulfil their conservation roles.

1) Identification, study, and description of new species and taxonomic definition

- Provide the taxonomic knowledge to support new species identification, description, monitoring and management.
- Develop capacity to recognize little-known species belonging to a varied assemblage of taxonomic groups, including animals, fungi, and plants.
- Ensure nomenclatural stability by housing name-bearing type specimens, collections, providing other scientific disciplines with a universal, unambiguous, and sustainable communication system about global biodiversity.
- Provide identification tools such as field guides, identification keys, identification apps, machine learning, DNA barcodes and other genetic technologies.
- Assure expertise in scientific research into the distribution, ecology, biology, human use, evolution, and physiology of many organisms.
- Provide the long-term preservation of voucher specimens, which form the backbone of scientific

reproducibility in this research field and impact all subsequent applications of taxonomic knowledge.
- Help in the identification of wild relatives of crop species and genetic resources to increase the resilience of domesticated resources to ongoing climate change, the emergence of new diseases and pathogens.

2) Emerging pathologies, pollution, and invasive species
- Competence to detect and analyze parasites in preserved animal, fungal and plant specimens.
- Ability to use voucher specimens and preserved tissue samples to identify viruses and other potential pathogens and pandemic vectors, such as Coronavirus in preserved fruit bats or Ebola in rodent specimens.
- Knowledge on comparative pathology, pathogen discovery, and pathogen ecology, in relation to zoonosis and the related risks to humans and other animals, fungi, and plants.
- Development of expertise in identifying and tracking invasive alien species.
- Skills in detecting pollutants within voucher specimens and conducting comparisons across samples collected at different time points.

3) Disentangling ecological and population issues
- Confirm the presence of historical biological samples in defined localities to aid mapping of historical distribution areas and calculation of range decline extent.
- Support conservation assessments and planning processes, such as Red List assessments, key biodiversity identification and species conservation planning.
- Provide expertise and resources vital for conservation translocations based on historical and ancient DNA extracted from preserved specimens.
- Collect phenological data and data on the impact of climate change.
- Gather and record developmental, life history, phenological, morphometric and demographic data.
- Develop metrics that are essential for quantifying biodiversity and change.

4) Biodiversity libraries as dissemination centers
- Act as nature documentation centers, making accessible a variety of resources including voucher specimens, tissue samples and digital biodiversity databooks, papers, photographs, videos, and acoustic libraries .
- Provide research materials, samples, biobanks and biodiversity data as a resource for a wide variety of conservation-relevant research fields.
- Capacity to provide a gateway to participatory science initiatives, including nature surveys, urban nature monitoring, monitoring of threatened and invasive species, and conservation projects.
- Develop expertise in educating people, particularly young generations, in recognizing natural science elements and their conservation requirements.
- Develop and test new technology and monitoring techniques (e.g., eDNA protocols, testing and samples).

5) Crossroads between taxonomy, discovery, and education
- Build partnerships with local communities, governments, non-governmental organisations, universities and civil society to support conservation initiatives.
- Apply expertise in designing, implementing and evaluating educational, outreach and participatory science programs to ensure measurable behavioral change and conservation outcomes.
- Promote and implement conservation policies, laws and international agreements, such as the Convention on Biological Diversity, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and the Habitats Directive.
- Develop and deliver educational programs, including school initiatives, university courses, internships, public lectures and virtual learning, with a focus on inclusivity for underserved communities.
- Establish conservation hubs to translate scientific research into tangible conservation strategies and community-led solutions.

6) Capacity building and resource development for conservation
- Recruit, train and empower professional staff and volunteers to ensure the effective and sustainable management of animals, fungi and plants.
- Secure long-term funding for conservation initiatives by engaging with various stakeholders, including individual donors, foundations, government agencies and local businesses.
- Driving strategic species assessments and conservation planning in collaboration with global networks such as the IUCN SSC, including hosting Specialist Groups or Centres for Species Survival.
- Implement the capacity to bridge the gap between science, policy and on-the-ground implementation to mobilise research and policy action.
- Assist in building capacity in developing countries to study biodiversity and engage in biodiversity conservation.

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