BIODIVERSITY

The rich diversity of ecosystems, the diversity within and between species, and the interactions that occur between species within ecosystems.

The Global Response to a Trifecta of Planetary Crises

Levels of mercury and carbon—both naturally occurring elements—are being released and remobilized by human activities at increasing rates. As a result, these levels far exceed their natural states of circulation, creating impacts that result in harm or damage to human and ecological health including loss of biodiversity.

Commitment to Address the Crises

Each of these crises has been met by a global convention:

- Convention on Biological Diversity (CBD)
- Minamata Convention on Mercury
- Framework Convention on Climate Change

These conventions share the commitment of the Parties to organize national actions and associated incentives to support related national and international policies and regulations.

The International Union for Conservation of Nature (IUCN) harnesses global knowledge, resources, and expertise to monitor the status of the natural world and present measures needed to safeguard it.

A Need to Coordinate Global Efforts

Through its **Centers for Mercury Studies and Conservation and Climate Change**, Biodiversity Research Institute (BRI) has invested major resources into studying the effects of mercury on the environment, developing carbon sequestration projects to help curb climate change, and most recently, addressing global biodiversity loss.

The underlying causes of biodiversity loss are often complex and stem from many interrelated factors such as habitat loss, development, over harvesting, invasive species, industrial activities, and pollution.

BRI established its **Biodiversity Research Program** in early 2025 to spearhead studies and collaboration with international organizations, government agencies, research institutions, and other conservation researchers.

Mercury contamination, severe climate changes, and accelerating biodiversity loss are all interconnected.

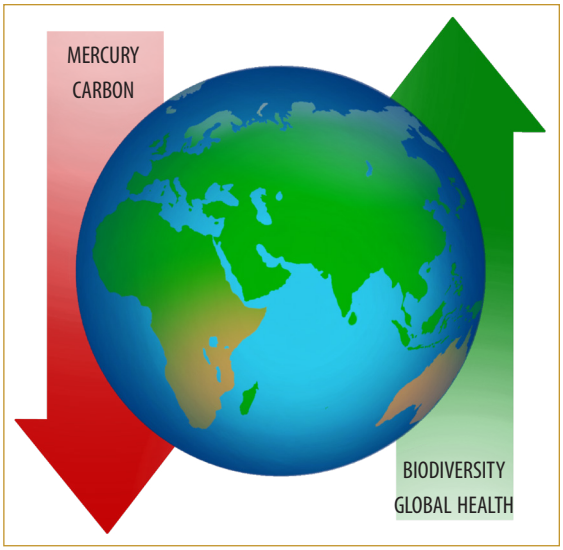

Figure 1: As mercury and atmospheric carbon levels decrease, threats to biodiversity will lessen.

Qualifications of BRI's Biodiversity Research Program

- Demonstrated expertise in analytical and behavioral ecology.
- Proven record of long-term field studies employing spatial and temporal modeling to detect ecological change over time.
- Effective integration of diverse data streams to improve understanding of baseline biodiversity conditions.
- Ability to synthesize insights across biodiversity sampling methods to assess how habitat, environmental, and land use factors influence species abundance, and richness.
- Broad ecological and taxonomic knowledge to identify and monitor indicator species.

Taking Action for a Sustainable Future

Convention on Biological Diversity

In 1992, the largest-ever meeting of world leaders took place at the United Nations Conference on Environment and Development, where the Convention on Biological Diversity (CBD) was signed. Goals of this first global agreement on the conservation and sustainable use of biological diversity include:

- Conservation of biodiversity
- Sustainable use of the components of biodiversity
- Sharing the benefits arising from the commercial and other utilization of genetic resources in a fair and equitable way

The Need for Biodiversity Surveys

Documenting changes in biodiversity within an ecosystem over time helps identify areas of highest conservation concern.

BRI staff and collaborators have the knowledge and expertise to conduct biodiversity surveys in various parts of the world and at various times of the year.

These surveys include the quantification of soil carbon, vegetation, invertebrate and wildlife populations to establish baseline conditions that will be used in comparison to replicated surveys conducted at a later date.

By the Numbers

BRI Biodiversity Survey Data - Tanzania, 2024

214
Bird species detected.

133
Plant species identified.

42
Dung beetle species identified.

24
Mammal species observed.

Establishing Biodiversity Survey Protocols

With over three decades experience capturing and sampling wildlife, BRI scientists are uniquely qualified to conduct biodiversity surveys.

We have developed extensive protocols for biodiversity surveys that meet the requirements of the CBD. These protocols can be adapted to different regions of the world and different habitats within those regions.

For more information, visit:
briwildlife.org/biodiversity-research

Indicator	Survey Methods
Vegetation 	• Transects • Plots • Live-sampling
Invertebrates 	• Sweep nets • Pitfall traps
Birds 	• Point counts • Driving transects • ARUs*
Bats 	• ARUs **Acoustic recording units*
Mammals 	• Driving transects • Game cameras

Theory of Change

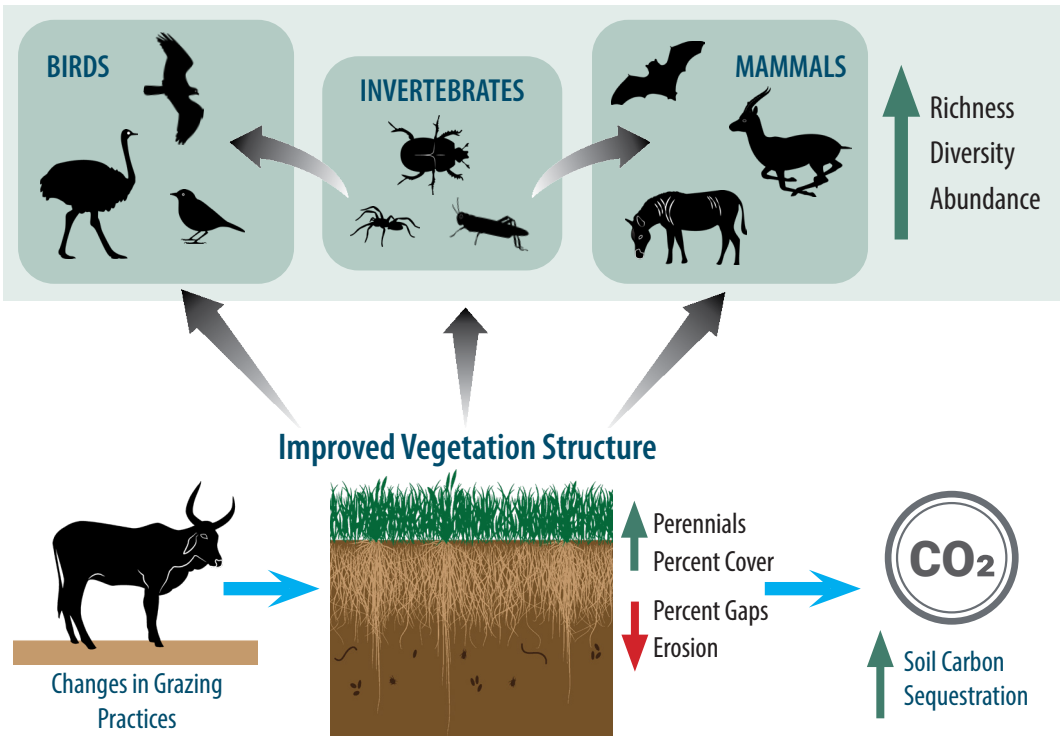

Figure 2: *This infographic shows how changes in grazing practices for a project may influence biodiversity at different levels, including vegetation, invertebrates, birds, and mammals.*

Biodiversity Credits: Bridging the Nature Funding Gap

What are Biodiversity Credits?

Biodiversity credits—also known as nature credits—are verifiable, traceable, and tradeable units of biodiversity gain from conservation or restoration activities. Improvements might result from changing grazing practices, reforestation, creating wetlands, or developing buffer zones around protected areas.

Companies and investors can purchase biodiversity credits to invest in conservation and restoration activities to complement other actions to avoid and reduce their impact on the environment.

Innovative and Sustainable

To address the global biodiversity crisis, 196 nations adopted the CBD's Kunming-Montreal Global Biodiversity Framework in 2022, which calls for new financial instruments that could bridge an estimated $700 billion shortfall in funding for nature.

In response to the need for credible projects, standardized frameworks (e.g., Verra's Nature Framework) have emerged and are in the beginning stages of certifying high-quality biodiversity credits for projects that restore biodiversity or avoid biodiversity loss.

Biodiversity Credits and Carbon Markets

Carbon credits are a related category of nature-based asset, similar to biodiversity credits in that they are verifiable, traceable, and tradeable financial instruments.

Projects that generate carbon credits have strong safeguards against harm to biodiversity or local communities.

Carbon projects may lead to substantial biodiversity benefits that, until biodiversity credits became available, did not provide financial incentives.

Biodiversity credits will be another tool in the conservation toolkit. The United Nations supports the concept because these credits can succeed where carbon offsets fail or don't apply.

BRI's Partnership With CarbonSolve

CarbonSolve is a U.S.-based company established to promote the development of carbon projects around the world. Their mission is to harness sustainable carbon finance to restore ecosystems, conserve wildlife, and benefit local communities.

CarbonSolve's initial projects focus on grassland and rangeland habitats, where grazing and/or fire management can enhance the soil's natural ability to remove carbon dioxide from the atmosphere.

BRI field scientists conduct the environmental studies (e.g., biodiversity surveys) needed to achieve project goals.

CarbonSolve certifies their carbon projects with Verra, the leading organization regarding standards for climate action and sustainable development.

Carbon Projects and Biodiversity Credits

Above and beyond demonstrating no harm to biodiversity, CarbonSolve's carbon projects are expected to bring important biodiversity benefits from the same activities that help soils remove and store more carbon dioxide from the atmosphere. CarbonSolve and BRI are exploring how financing from biodiversity credits can enhance the activities of their carbon projects, tailoring or expanding project activities to maximize the benefits for native wildlife.

By the Numbers

A World View

1 Million

Approximate number of species at risk of extinction across the globe.

Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) UN 2019 Global Assessment

73%

Estimated decline in average size of monitored wildlife populations from 1970 to 2020.

2024 Living Planet Report World Wildlife Fund

23%

Amount of the global land surface that has been affected by land degradation.

2019 Global Assessment, IPBES

$700 Billion

Annual financing gap between current funding for biodiversity conservation and funding needed.

Kunming-Montreal Global Biodiversity Framework

$2 Billion

Estimated size of biodiversity credit market by 2030, up from $8M in 2023.

World Economic Forum

***Left:** Masai Giraffe (Giraffa camelopardalis tippelskirchl), Tanzania; listed as Endangered on IUCN Red List.*

Moving Forward with Responsible Actions for Sustainable Results

Critical Connections

In the quest to conserve life on Earth, many global environmental conventions have been initiated. The increasing threat of climate change has broadened the perspectives of individual groups and there is a movement promoting the integration of knowledge gained in order to achieve more than any single entity can on its own.

BRI, whose mission is to assess emerging threats to wildlife and ecosystems through collaborative research, is working on many fronts to help mitigate the effects of climate change. For more than three decades, we have been studying the impacts of mercury in the environment, and through these studies have stretched our global reach and developed the expertise and the tools needed to tackle the triple threats of mercury, climate change, and the loss of biodiversity presented in this publication.

Partners and Collaborators

BRI's abilities span a variety of specialties related to capacity building and awareness-raising that are scientifically evidence-based to develop net positive scenarios (Figure 3). As such, BRI is in a unique position to work under contract with the UN Environmental Programme (UNEP), the UN Industrial Development Organization (UNIDO), and the UN Development Programme (UNDP) to help Parties meet their obligations of the Minamata Convention.

Under formal agreements, new efforts by BRI with the CBD and the IUCN provide us a shift to tackle the triple threat of mercury pollution, climate change, and loss of biodiversity. The long-term resources from CarbonSolve significantly improve this ability for BRI to meet broader global needs identified by the Global Environmental Facility (GEF).

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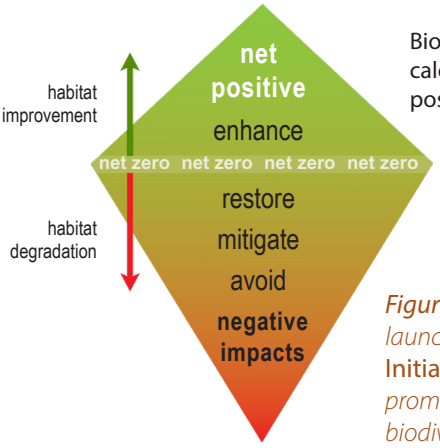

Biodiversity credits are calculated based on net positive results.

Figure 3: In 2024, BRI launched its Net Positive Initiative *to identify and promote advances in global biodiversity gain.*

By the Numbers

BRI Biodiversity Survey Data
2023-24 *Kajiado County, Kenya*

1,019
Kilometers of transects driven.

668
Pitfall traps deployed.

438
Bird Point Counts conducted.

169
Camera traps deployed.

104
Vegetation surveys conducted.

80
Acoustic recorders deployed.

9
Surveys BRI conducted in S-W Zambia, N-Central Kenya, Southern Kenya, Northen Tanzania, and South Dakota, USA

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