

FEEdA: Research Initiative for the Conservation of Biodiversity



A FONA Flagship Initiative of the BMBF to develop research-based systemic solutions for the conservation of biodiversity in Germany

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Biodiversity conservation — A global challenge

Biological diversity is one of the central foundations of human life. It provides the basis for food, clean water, energy, recreation, and medicinal products, and regulates the climate and air quality. Over the past several decades biodiversity has declined drastically and more species than ever before are facing extinction, as is well documented by the latest IPBES reports¹ and the growing IUCN Red List.

Biodiversity is affected by many different sectors within and across political and economic systems (agriculture, nutrition, health, etc.), making broad measures tackling biodiversity difficult to enact. Therefore, balanced systemic solutions are needed that consider both the different political and economic requirements as well as the need for biodiversity protection.



Dr. Julian Taffner (head of Central Coordination) installs a new insect house at the Senckenberg Museum, Frankfurt.

Knowns and unknowns

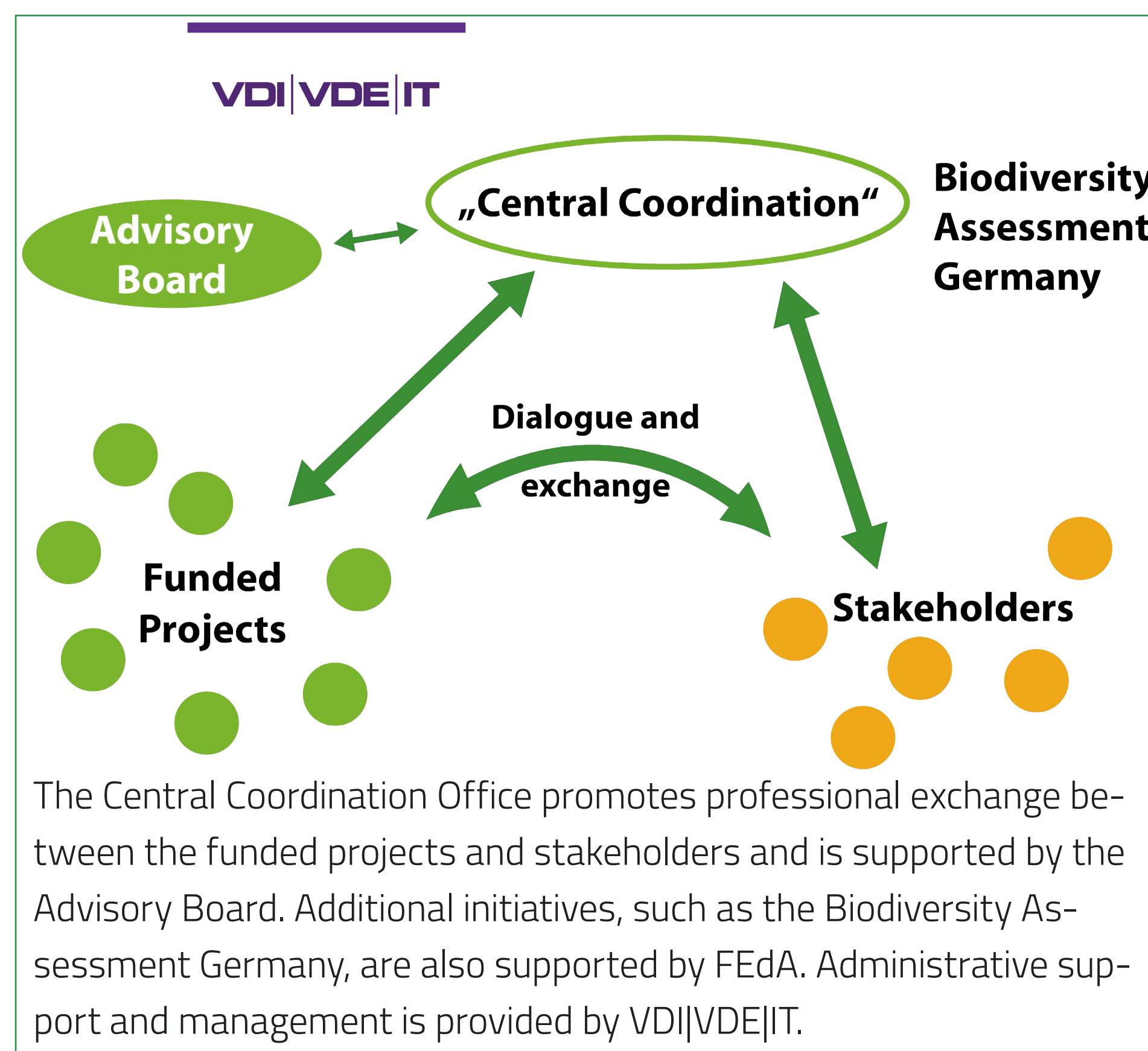
Compared to the climate crisis, the drivers of biodiversity decline and their interactions remain poorly understood, public awareness is low, and political action taken to date has been insufficient despite repeated warnings. Media reports often focus on well-known large animals, while inconspicuous or less charismatic species — but no less ecologically important — are overlooked. Nevertheless, research has been able to determine several drivers of biodiversity decline, emphasized in the IPBES reports¹⁻³.

Direct drivers of biodiversity loss

- Changes in land use, e.g. due to agriculture and urbanization with concomitant habitat destruction
- Pollution, e.g. through overuse of pesticides and fertilizers
- Over-exploitation of natural resources
- Invasive alien species
- Climate change

Indirect drivers of biodiversity loss

- Unsustainable economic development
- Consumption and production patterns influenced by socio-economic and demographic trends
- Harmful economic incentives and policies associated with unsustainable practices
- Conflicts and epidemics



FEEdA — Principles and approach

The FEEdA program was launched by the German Federal Ministry of Education and Research (BMBF) to fund transdisciplinary projects that explicitly invite scientists as well as stakeholders from civil society and the economic sector (municipalities, nature conservation organizations, businesses, agricultural associations, and others) in order to co-develop research-based systemic solutions and practical guidelines. A total of 21 projects are currently funded within the FEEdA framework, including those of the first call, "Valuing and safeguarding biodiversity in politics, business, and society (BiodiWert)".

FEEdA's three fields of action

- Monitoring biodiversity using innovative technologies
- Understanding the causes and consequences of biodiversity changes
- Developing systemic solutions and measures

1) Improving the efficiency of biodiversity monitoring

Currently, our knowledge of the extent and dynamics of biodiversity loss in Germany is fragmented and decentralized. Different datasets are often not linked, lack long-term data, and include only selected species groups. The challenge is therefore to achieve a comprehensive, coherent, standardized, and timely monitoring of a broad range of species as well as entire ecosystems.

FEEdA aims to support these efforts by funding the development of innovative technologies that can rapidly and automatically generate and store data in a way that is standardized and accessible long-term.

Examples of projects that integrate biodiversity monitoring

- AMMOD (Automated multisensor stations for monitoring of biodiversity)
- GiBBS (Holistic biodiversity management in construction materials industry)

2) Understanding the causes, dynamics, and consequences of biodiversity changes

While the general causes of biodiversity loss are known, knowledge gaps remain, especially regarding the indirect drivers, which have so far been understudied¹. Species that

are rare or difficult to assess, such as soil organisms, have also been neglected⁴. Another overarching problem is the oversimplification of "biodiversity" into merely the number of species present, leading to the lack of in-depth understanding of ecosystems themselves, the services they provide, and the complex interconnections between ecosystems and species.

Bridging these knowledge gaps will allow us to truly understand the dynamics of biodiversity and to find appropriate, realistic measures for stopping its decline.

Examples of projects that investigate biodiversity changes

- BioDivKultur (Integrative research to promote insect diversity in green spaces)
- REWILD_DE (Conservation of biodiversity and valorization of ecosystem services through rewilding)
- SLInBio (Urban lifestyles and the valorization of biodiversity)

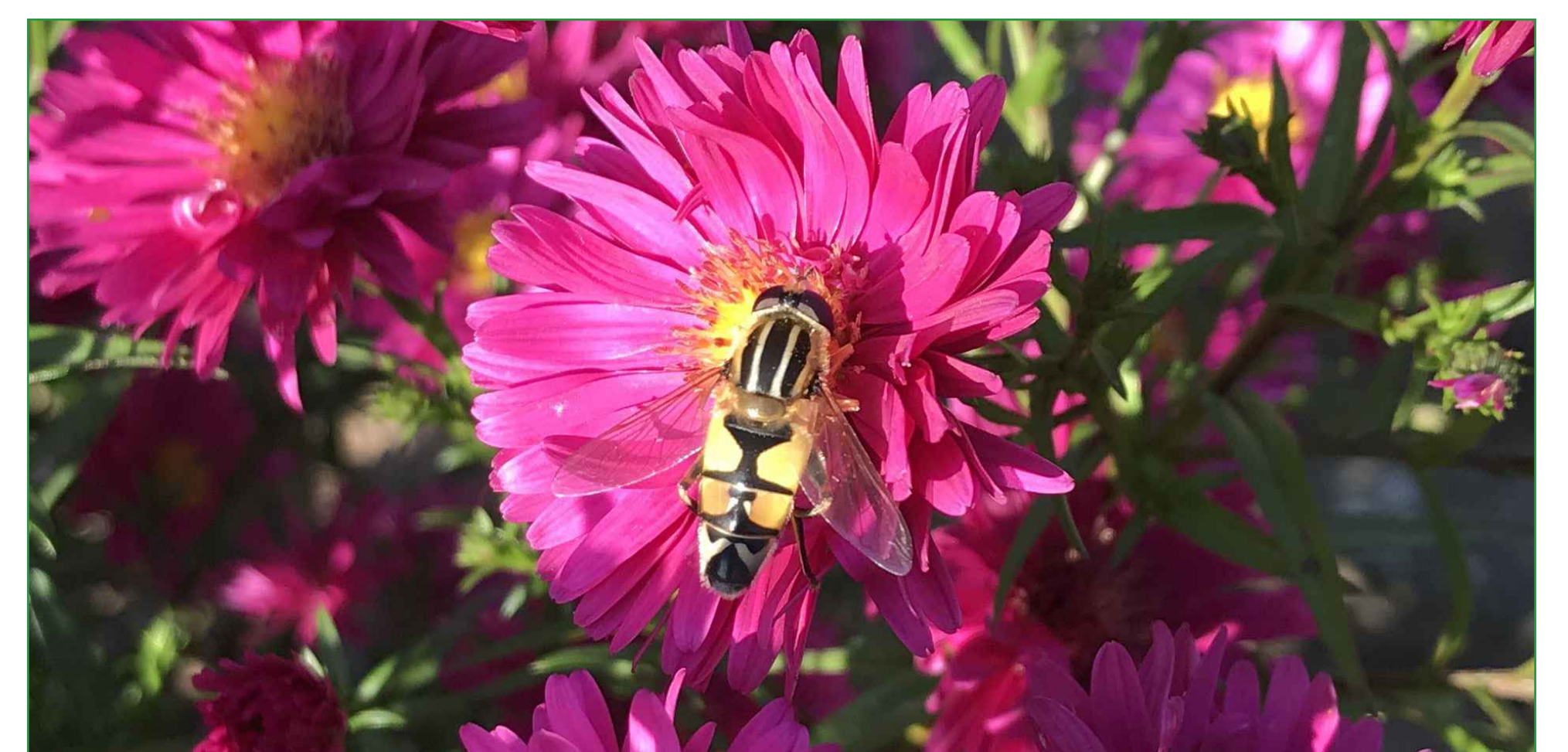
3) Developing solutions to protect biodiversity

The protection, maintenance, and sustainable use of biological diversity must be integrated into policy at various levels (local, regional, national, international). Knowledge and views of stakeholders must be considered for successful implementation.

FEEdA projects are therefore partnered with organizations of diverse sectors and together conduct assessments of the suitability, impact, and necessary conditions for specific conservation measures. Such measures are tested locally to develop strategies that can be transferred to other settings.

Examples of FEEdA projects that focus on developing solutions

- GOBIOM (Design options for economically viable biodiversity-promoting milk production systems)
- ECO²SCAPE (Co-design of ecologically and economically efficient policy instruments and measures for conserving biodiversity and ecosystem services in cultural landscapes)
- Grassworks (Restoration of species-rich grassland — multi-regional assessment of socio-ecological systems and pilot implementation)



Pollinators like this hoverfly (*Helophilus trivittatus*) are essential for healthy and diverse ecosystems. Many species of pollinators are threatened with extinction.

References

1. IPBES. *Global assessment report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*. (Secretariat of the IPBES, 2019).
2. IPBES. *The assessment report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on pollinators, pollination, and food production*. (Secretariat of the IPBES, 2016).
3. IPBES. *The IPBES assessment report on land degradation and restoration*. (Secretariat of the IPBES, 2018).
4. Eisenhauer, N., Bonn, A. & Guerra, C.A. Recognizing the quiet extinction of invertebrates. *Nat. Commun.* 10, 50 (2019).