

INFRASTRUCTURE AND ECOLOGY NETWORK EUROPE

STRATEGIC ORIENTATION



IENE

Infrastructure & Ecology
Network Europe

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Summary:

The Infrastructure and Ecology Network Europe (IENE) began in 1995 as a European platform responding to a demand from public authorities to address the effects of habitat fragmentation caused by infrastructure developments.

In response to the imperative need of reversing the loss of biodiversity, the overarching goal of IENE is to promote ecologically sustainable, resilient and safe transport infrastructure networks.

Therefore, IENE aims to avoid - reduce - compensate the impact of transport infrastructure development on biodiversity, and to support the ecological restoration, and climate change adaptation.

IENE promotes international cooperation in research and knowledge exchange about best practices to mainstream biodiversity in transport infrastructure.

The IENE Strategic Orientation is based on the following fundamental pillars:

- I.** Mainstreaming biodiversity in policy and decision-making to develop appropriate strategies and legal frameworks.
- II.** Supporting applied research and fostering international cooperation to accelerate the application of innovative practical solutions.
- III.** Sharing knowledge and building capacity for stakeholders engaged in planning, constructing, and operating transport infrastructure.
- IV.** Strengthening the implementation of best practice at the local scale to develop Green Infrastructure¹ and promote biodiversity net gain.

¹ Green infrastructure is defined by the EU as "A strategically planned network of natural and semi-natural areas with other environmental features, designed and managed to deliver a wide range of ecosystem services, while also enhancing biodiversity."

https://environment.ec.europa.eu/topics/nature-and-biodiversity/green-infrastructure_en

Introduction:

IENE in a Decade of Global Environmental Challenges

The impact of anthropogenic activities on ecosystems has become increasingly evident in the first decades of the 21st century. It requires an unprecedented global response and effective local action. Biodiversity conservation combined with climate change actions are emerging as central topics in international negotiations on sustainable development.

Infrastructure developments induce profound changes to natural landscapes and reduce the benefits of ecosystem services. The detrimental environmental impacts of infrastructure are increasingly acknowledged as a serious threat to biodiversity, especially through their cumulative effects on species and ecosystems. In Europe, transport networks and intensified land use have created the most fragmented landscapes in the world. Indeed, the transport sector is closely connected to the five main direct drivers of biodiversity loss identified in 2019² by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES).

The Decisions of the 14th meeting of the Conference of the Parties to the Convention on Biological Diversity (CBD/COP14) in 2018, called for mainstreaming biodiversity values in all sectors and aligning financial flows to preserve biodiversity instead of destroying it. In 2022, the post-2020 Kunming-Montreal Global Biodiversity Framework (CBD/COP15) includes securing ecological connectivity in several goals and targets. With the onset of the United Nations' "Decade of Restoration", defragmentation, i.e., the restoration of ecological connectivity, is one of the most challenging concepts in the fields of Transport Ecology and Sustainable Transportation. This must be combined with avoidance, reduction and compensation of environmental impacts of new transport infrastructure, as well as taking into account existing and older infrastructures when they are decommissioned.

At the European level, the EU Green Deal and the EU-Biodiversity Strategy for 2030 "Bringing nature back into our lives" aim to achieve a coherent and resilient Trans-European Nature Network through cooperation between Member States. Actions have to be taken from the research and knowledge community, from citizens, businesses, and social partners to protect and restore biodiversity. Additionally, investments in Green Infrastructure have to be made while developing transport infrastructure.

IENE, through its mission and unique position in Europe and its international network, provides an independent, international, and interdisciplinary forum to foster new cooperative and innovative knowledge, support decision-makers and encourage the development of innovative solutions for sustainable transport infrastructure.

² IPBES (2019): Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. E. S. Brondizio, J. Settele, S. Díaz, and H. T. Ngo (editors). IPBES secretariat, Bonn, Germany. 1148 pages. <https://doi.org/10.5281/zenodo.3831673>

The IENE Strategic Orientation is based on the following fundamental pillars:

I. Mainstreaming biodiversity in policy and decision-making to develop appropriate strategies and legal frameworks.

IENE supports mainstreaming biodiversity-related concerns into infrastructure development by providing recommendations on policy decisions, legal instruments, planning procedures and technical guidelines.

Contributing to the development of the EU Nature Restoration Regulation, IENE can be a key player in guiding the implementation of integrated measures by ensuring the adoption of the concepts of defragmentation and ecological connectivity in strategic planning, environmental impact assessment and implementation of effective practices on infrastructure development.

Moreover, effective strategies for avoidance, reduction, compensation and restoration should be based on sound scientific evidence while refined approaches may be required to balance the increasing pressure on the environment and the comprehensive energy and transport planning. Defining innovative and sustainable modes of transport, in combination with decarbonisation and digitalisation, is a fundamental concern. Infrastructure developments that alter natural landscapes and reduce benefits of ecosystem services without prospects of mitigation should be avoided whenever possible.

The initial objective of IENE is to bring biodiversity protection into the decision-making process of transport infrastructure development as early as possible.

II. Supporting applied research and fostering international cooperation to accelerate the application of innovative practical solutions.

IENE initiates actions to mobilise the international scientific and technical community to develop timely and cost-effective solutions to emerging issues. Interdisciplinarity and cross-sector cooperation are supported as a necessity.

IENE promotes innovation and strengthens scientific and technical collaboration at European and international levels in the fields of infrastructure and ecology, and finally facilitates science-policy dialogues and streamlines scientific and technical breakthroughs into practice.

IENE fosters transdisciplinary research, identifies funding needs and encourages the application of evidence-based expertise, technical guidance and ecological engineering, in implementing effective measures to balance infrastructure needs with the recovery from biodiversity loss.

IENE uses its network and experience to highlight emerging research topics and promote young researchers to increase the impact and relevance of the transport ecology field of study, fostering future experts with modern scientific and technical know-how.

III. Sharing knowledge and building capacity for stakeholders engaged in planning, constructing, and operating transport infrastructure.

IENE acts as a bridge between research and action and combines available scientific evidence and state-of-the-art assessments to guide and support decision-making.

IENE's fundamental objective is to promote the engagement of the wider range of stakeholders supporting public and private sectors' collaboration to foster sustainable development and provide infrastructure services with minimal impact on biodiversity and environment.

Preventing habitat fragmentation and the loss of environmental quality requires a collaborative large-scale effort and a coordinated implementation of integrated measures and infrastructure strategies. These efforts equally require resources and stakeholders' engagement beyond national borders. More than ever, there is a need to:

- Share knowledge on ecological effects, integrated solutions and best practices;
- Make scientific data and practical experience available to all stakeholders;
- Promote the implementation of policy and standards;
- Establish sustainable and environmentally responsible funding;
- Capitalise on education and communication based on lessons learned;
- Invest on producing evidence-based knowledge;

IENE considers public participation to be crucial in decision making and supports awareness raising initiatives on infrastructure and ecology challenges.

IV. Strengthening the implementation of best practice at the local scale to develop Green Infrastructure³ and promote biodiversity net gain.

IENE supports the integration of Green Infrastructure in transport infrastructure development to preserve biodiversity, maintain habitat connectivity, and dissolve barriers. All crossing structures that have a potential for use of wildlife and support infrastructure-related habitats should be assessed to be integrated into the Green Infrastructure as essential components for ecological connectivity.

IENE proposes the establishment of a monitoring system to evaluate the effectiveness and improve the results of mitigation for sustainable infrastructure, preserving ecosystem services and investing in Natural Capital.

Nature-based Solutions can offer a sustainable and economically viable alternative to technical conventional solutions for the

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environmental adaptation of infrastructure. Improving the management of infrastructure corridors could increase biodiversity, and provide climate adaptation and infrastructure resilience.

The use of transport and other infrastructure-related habitats provides opportunities to reinforce Green Infrastructure and ecosystem services like counteracting climate change. Their design, construction and management define their potential as biodiversity habitats or corridors. At the same time, the creation of ecological traps and the spreading of invasive species must be avoided.

IENE promotes innovative approaches to exploit the full potential of nature-based solutions. IENE also encourages the development of new knowledge and guidelines to decide how, when and where opportunities for biodiversity can be provided without risks for adverse effects and supports the need for sustainable management of these areas.

Based on these four pillars, IENE supports a long-time framework of an overall evaluation of the mainstreaming of biodiversity and infrastructure in a permanent follow-up process.