



IENE 2024

Biodiversity in the headlight
of future transport

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Transport and energy infrastructure are key drivers of global economic development. According to the G20, the forthcoming investment of over \$94 trillion worldwide in the transport and energy sectors represents a major opportunity for stimulus packages such as the EU Green Deal. However, the 50% increase in networks by 2040/2050 is also a major challenge for biodiversity and the environment.

Their negative impacts on climate change and biodiversity are significant and deserve consideration as they impact global economic development. Indeed all networks: transport, energy and renewable energies must, jointly, address the issue in order to optimise synergies. Sustainability research and policy in the transport and energy sector must now take into account both biodiversity and climate issues.

For two and a half years, the BISON project, supported by the European Commission, has sought to respond to this challenge, attracting a wide response at national, European and international level for the first time. The suddenness, diversity, and magnitude of actors that joined and supported the action highlight how BISON catalysed needs and gaps. The Strategic Research and Deployment Agenda developed there, first of its kind in the world, is not a ready-made solution for achieving full environmental integration in transport infrastructure. Rather, it serves as an essential step to initiate concrete dialogue and cooperation with stakeholders who often work in isolated silos. It endeavours to catalyse transformative change and pave the way for a more harmonious coexistence between biodiversity and infrastructure where public AND private actors have to work closely together.

Keywords: Research, innovation, strategy, transport, energy, decision

The story of Saker Falcon in Slovakia

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The use of power line pylons for the placement of nest boxes can help in increasing the population of some endangered bird species. Such a species is the Saker Falcon, which has lost its breeding habitat mainly as a result of intensive forestry activities. While around the 80s all known pairs in Slovakia nested in the mountains or floodplains, since 1991 there has been a significant change in the preference for nesting habitat. Since this year, the Raptor Protection of Slovakia has been working in cooperation with the company Slovak electricity transmission system to progressively create new nesting opportunities in the form of nest boxes (at least 400 of them have been installed so far) fitted to pylons. Individual pairs began to gradually occupy sites in agroecosystems in the lowlands, since 2009 all pairs have been continuously nesting only on power line pylons of 400, 220, and 110 kV lines. After 2000, 20-45 pairs (2008-2012) and 35-52 pairs (2013-2018) were known. In 2022 and 2023, 45 and 40 pairs were identified, which produced 166 and 135 chicks, respectively. Many of the breeding pairs are under a high risk of possible electrocution, as they often use the poles of 22 kV lines for resting or tearing the prey. The present paper was prepared within the project "LIFE19 NAT/SK/001023 LIFE Danube Free Sky - Transnational conservation of birds along Danube river", co-funded by the European Union under the LIFE Programme and the Ministry of Environment of the Slovak Republic.

Keywords: Saker Falcon; power lines; nest boxes; electrocution;

The use of artificial intelligence (AI) for monitoring invasive alien plant species and wildlife-vehicle collisions

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Creation of an AI-based solution to identify and mitigate invasive plant species along roads in Denmark, Sweden, and Iceland, targeting biodiversity protection. Existing manual monitoring by biologists in service vehicles is sporadic and insufficient for continuous controlling invasive species like *rosa rugosa* or lupine. The solution involves vehicle-mounted cameras using AI for constant invasive species identification, enabling automatic, real-time data collection for road authorities. This initiative demonstrates AI's capability in transforming environmental protection efforts, offering a data-driven approach to tackle biodiversity threats. Trifork leverages its extensive experience in AI and image analysis for this project and is also working with the Road Administrations on a roadkill monitoring solution as part of the same solution. During the presentation you will see pictures and videos from the system in production and see the results of recognition and the potential usage of data for other purposes.

Keywords: Invasive species, AI, Vision detection, Innovation project, Denmark, Iceland, Sweden

Understanding Roadkill Hotspots: Insights from Comprehensive Wildlife Roadkill Databases

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Wildlife roadkill databases often compile valuable information regarding species, timing, and locations of roadkill incidents, with some databases also including details such as gender and age classes. As part of the "LIFE LINES - Linear Infrastructure Networks with Ecological Solutions" project, we aggregated roadkill data from various sources, including road operators, traffic police, and academic institutions, into the Portuguese National Roadkill Database. This database encompasses over 130,000 records spanning most terrestrial vertebrates found in the country, ranging from small (< 1 kg) to medium (1-10 kg) and large (> 10 kg) species. Different sources contribute varying data, with academia accounting for all species and sizes, road operators primarily documenting medium and large vertebrates, and traffic police focusing mostly on large vertebrates. Notably, different data sources yield distinct roadkill hotspot patterns. By analysing a specific subset of the database consisting of daily monitored roadkill incidents, we investigated how different monitoring intervals affect the frequency and location of hotspots across various vertebrate classes, orders, species, and size categories. Our findings reveal that for smaller species like bats and amphibians, sampling intervals exceeding one day result in contrasting patterns compared to daily sampling, while for most medium and larger species, such discrepancies occur primarily with sampling intervals exceeding one week. We discuss the implications of these results for the development of effective roadkill monitoring and mitigation initiatives.