

TRANSGREEN

Integrated Transport and Green Infrastructure Planning in the Danube-Carpathian Region for the Benefit of People and Nature



A Lookback on the Project

June 2019

Project co-funded by the European Regional Development Fund (ERDF).

Overall Budget: 2.481.321,16 Euro

ERDF Contribution: 2.109.122,95 Euro



TRANSGREEN. Integrated Transport and Green Infrastructure Planning in the Danube-Carpathian Region for the Benefit of People and Nature

TRANSGREEN aims to contribute to safer and environmentally-friendly road and rail networks that are being developed in the Czech Republic, Hungary, Romania, Slovakia, and Ukraine.

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www.interreg-danube.eu/transgreen

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Before setting foot on the road to connectivity...

Ecological connectivity is essential for preserving the Carpathian Mountains. The Carpathians are an extraordinary place with wonderful natural treasures, including large carnivores. Large carnivores, such as bears, wolves and lynxes stand witness for the health of Carpathian ecosystems.

Since we ourselves are the people living in the Carpathian area, we understand well the need for improved transport infrastructure in this region. At the same time, we need to identify good solutions to minimise the impact of new roads and railways on nature and wildlife in the Carpathians, all while using the **Mitigation Hierarchy Principle: Avoidance, Mitigation and Compensation**.

TRANSGREEN's vision is to create a better connected Carpathian Region with transport infrastructure that takes nature into account. The project aims to find positive solutions which bring all relevant parties to the same table and plan transport infrastructure together.

Over 2.5 years, TRANSGREEN demonstrated how a multi-sectoral planning process for transport infrastructure development can look when key sectors collaborate:

- » transport sector represented by motorway companies and ministries of transport;
- » environmental authorities and environmental NGOs;
- » research institutions, such as a transport research centres and technical universities.

The collaboration resulted in outcomes such as:

- » practical guidelines on integrated linear transport infrastructure planning addressing planners, implementers and politicians;
- » recommendations to fill the gaps at the policy level; and
- » concrete measures proposed for critical locations in four pilot areas that were analysed based on scientific data.

All project publications are available on the [project website](http://www.interreg-danube.eu/transgreen) (www.interreg-danube.eu/transgreen). **The project objectives focused on scientific research, minimisation of conflicts and cooperation**, which we invite you to explore in the following pages.

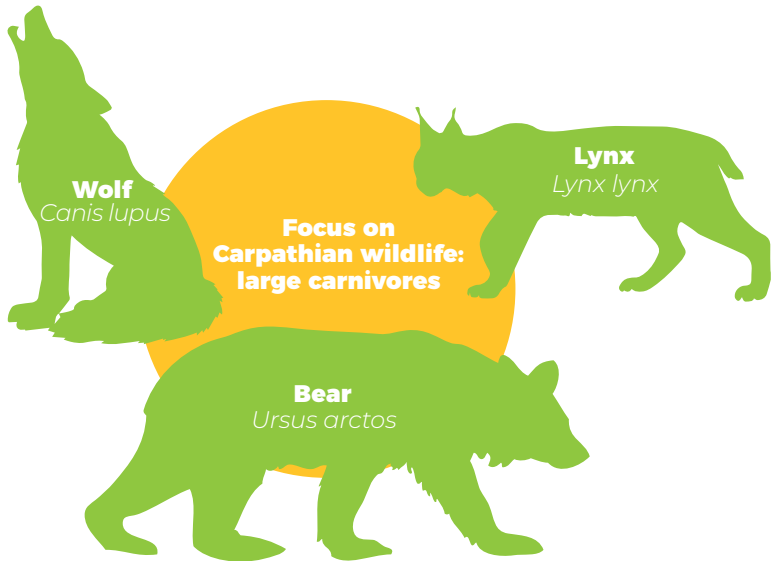
Let's take a step forward on the way towards safer and environmentally-friendly road and rail networks in the Carpathians!

TRANSGREEN in a nutshell

The network of highways and railways that connects key areas of Central and Eastern Europe (CEE) to the rest of the continent has already entered the planning stage. **As it stands, this substantial infrastructure threatens to fragment, divide and disturb valuable ecosystems in protected natural areas across the Carpathian Mountains**, including Natura 2000 sites.

In order to prevent, or at least diminish these threats and pressures on nature, the TRANSGREEN Project aimed to **develop an environmentally-friendly and safe transport network** in the Czech Republic, Hungary, Romania, Slovakia and Ukraine.

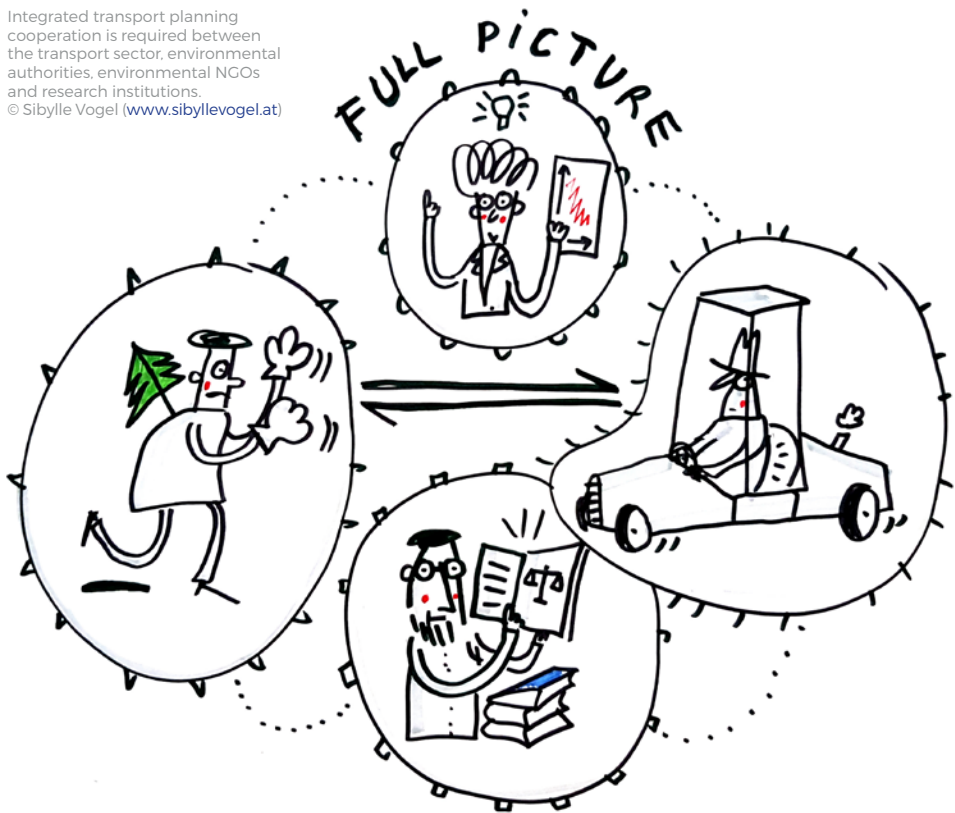
One focus was to maintain **uninterrupted ecological corridors** which would ensure the free movement of species such as large carnivores most vulnerable to the impact of motorways and railways, as well as certain species of herbivores.



Multi-disciplinary partnership for integrated transport planning

Partners from the fields of research, government, environment and construction joined forces to foster dialogue and promote the inclusion of new perspectives in planning processes and policy-making. These organisations had the know-how, capacity, experience and authority to design concrete solutions to reduce environmental impact and suitable **Green Infrastructure** elements for reducing the environmental impact of the expanding land transport infrastructure in the four selected pilot areas along the **Trans-European-Network of Transport (TEN-T)**.

Integrated transport planning cooperation is required between the transport sector, environmental authorities, environmental NGOs and research institutions.
© Sibylle Vogel (www.sibyllevoegel.at)



The drawing was created by illustrator Sibylle Vogel (www.sibyllevoegel.at) within the TRANSGREEN project, and represents an original invitation for experts from these four professional fields to communicate openly and to collaborate.

Scientific research

Good planning requires high-quality data, information and knowledge. Meeting these prerequisites enables conservationists, infrastructure planners, scientists and politicians to work together in a constructive manner to determine the most acceptable trade-offs for sustainable development.

TRANSGREEN provided a sound scientific knowledge base, including new data with a focus on the four pilot areas. Ecological corridors were identified, wildlife was tracked and monitored through conventional methods and telemetry, traffic data was collected, and existing paths along transport routes were analysed. The newly established database was built on the foundations of pre-existing ones, and has served as the basis for the proposal of concrete measures to **minimise conflicts between wildlife and road/rail infrastructure** (*the Catalogue of Measures*).

To improve data transparency, the **Carpathian Countries Integrated Biodiversity Information System** (www.ccibis.org) has been enriched with data derived from the project.

Please refer to the pilot area chapters for more information on the created data sets.



Research offers the basis for decisions regarding transport infrastructure that take nature into account.

Stbylle Vogel

How environmental NGOs see research institutions

Minimisation of conflicts

TRANSGREEN tackled conflicts between transport infrastructure planning and green infrastructure objectives (Natura 2000, wildlife corridors, road-less areas, etc.) in four pilot areas in the Carpathians. Based on scientific data, concrete measures were identified with the involvement of local and national stakeholders that resulted in four *Catalogues of Measures*.

Based on the *Catalogues of Measures*, various actions were be launched within the limited project duration times. Actions include the installation of "Beware of Wildlife" warning signs, speed limits, planning support for one green bridge in the Czech Republic and the introduction/testing of a roadkill registration system that involves civil society. However, the most important solution is collaboration with local stakeholders in order to raise awareness on the topic and gain their input on the new infrastructure plans. Such cooperation should also include discussions to jointly elaborate data (ecological corridors, wildlife presence, etc.) and the implementation of measures based on them. Introducing transport infrastructure plans to local stakeholders enables them to better realise how they will be affected in their daily lives. Concrete solutions can be elaborated. For example, a recommendation to build a multi-functional passage that benefits both people and wildlife. Local and national experts were trained on how to conduct an [environmental impact assessment](#) (EIA) that takes ecological corridors into account. Experience exchange between the pilot areas created a network of transnational collaboration.



Sibylle Vogel
How research institutions see environmental NGOs

For road and rail networks that take nature into account, it is essential to minimise conflicts.

The basic principle of TRANSGREEN work on environmentally-friendly transport infrastructure is the **Mitigation Hierarchy** that says "prevention is better than cure" – avoiding negative effects of habitat fragmentation is better than repairing or reducing the damage after the fact. Where avoidance is impossible/impractical, mitigation measures must be designed as an integral part of the scheme. Where mitigation is insufficient or significant residual impacts remain, then compensation is required as a measure of last resort.

These principles should be applied to existing roads or railways where repair and maintenance is needed, as well as to newly planned grey infrastructure.

Fostering cooperation

Most important when tackling cross-sectoral topics is to bring all the different stakeholders to the table in order to build trust and a commonly understandable language as the basis for an effective and efficient decision-making process.

TRANSGREEN worked with relevant stakeholders from the transport, spatial planning and environmental sector at the local, national and transnational level.

At the **local level**, stakeholders were invited for local kick-off meetings, face-to-face and working meetings and training events on environmental impact assessment.



An integrated approach and coordination is key to sustainable transport infrastructure.

How the transport sector sees environmental authorities

The *Catalogue of Measures* was introduced, and stakeholders became aware of the risks and possible solutions for conflictual areas along the transport routes.

At the **national level**, multi-sectoral meetings on different topics took place at the ministerial level. In Romania, such meetings were organised to elaborate the adaptation of the **Wildlife and Traffic Guidelines** to Romanian conditions. In Ukraine, where the law on environmental impact assessment (EIA) was only recently adopted, TRANSGREEN brought in the EIA Training Package to raise capacity at both the national and local level. In Slovakia, the draft proposal of the **Joint Strategic Action Plan** related to the **Carpathian Convention Protocol on Sustainable Transport Development in the Carpathians** was discussed and feedback given. In Hungary and the Czech Republic, TRANSGREEN outputs were presented and possible applications discussed.

At the **transnational level**, cooperation with the Carpathian Convention should be highlighted. The Project brought substantial input to the development process of the **Joint Strategic Action Plan** related to **the Transport Protocol**. The cross-sectoral meeting attached to the mid-term conference was especially successful. Possible components were collected and openly discussed in a “world café session.” “Joint” means that the Carpathian Convention Working Groups on Biodiversity and Transport feel a common ownership of the document that will be up for adoption at the 6th Conference of Parties in autumn 2020. TRANSGREEN partners were invited for cross-sectoral, cross-border meetings at the ministerial level for the elaboration of innovative solutions for the Beskydy-Kysuce Pilot Area.

At the **European level**, TRANSGREEN collaborated with the **European Strategy for the Danube Region (EUSDR) Priority Areas PA1b Road & Rail and PA6 Biodiversity** handed in concrete recommendations toward the revision of the **EUSDR Action Plan** for the next funding period. TRANSGREEN was included as a best practice case study in the “*Guidance on EU-level Green and Blue Infrastructure Projects*.” Furthermore, experts representing the **Infrastructure and Ecology Network Europe** (IENE) became engaged and brought in knowledge expertise on the topic that positively impacted the quality of TRANSGREEN outputs.

Pathways to Greener Transport Infrastructure

Conference on solutions and policy options
for sustainable road & rail networks in Europe

Bucharest, 25th of June 2019

The TRANSGREEN Final Conference was organised in Bucharest on the 25 June 2019 under the aegis of the Romanian Presidency of the Council of the European Union and the Presidency of the EU Strategy for the Danube Region. The event brought together around 100 representatives from national authorities, the EU Commission, the Carpathian Convention Secretariat and other international institutions, academia and NGOs working in the fields of transport, spatial planning, and nature conservation. They were united by the wish to make linear transport infrastructure development more sustainable, safe and resilient by avoiding landscape fragmentation, particularly in the Danube-Carpathian Region.

The Conference concluded that minimising and mitigating conflicts between linear transport infrastructure and nature protection not only is of high importance, but also possible if a science-based and pro-active cross-sectoral approach is applied at the local, national, regional and EU level. The Carpathian Convention and its Protocol on Sustainable Transport was acknowledged as a key promoter of this approach.



Bucharest Conference Declaration on Sustainable Transport

We, the conference participants, accepting the need for development of sustainable transport infrastructure in the Danube-Carpathian region, herewith call on the European Commission, the European Parliament and the national governments of the Danube-Carpathian region to preserve the biodiversity and ecosystems functionality of the region and to

- » Foster interagency and international coordination for the systematic integration of biodiversity objectives into transport policy/projects and conditionalities for financing.
- » Encourage cross-sectoral collaboration and stakeholder involvement right from the concept stage of each linear transport infrastructure project in order to find best solutions for the harmonization of transport development needs with biodiversity on the level of planning, construction, operation and maintenance.
- » Build an accessible common database consisting of high quality data, tools, information and knowledge on biodiversity, spatial planning and transport infrastructure development in order to support good planning and decision-making processes.
- » Acknowledge that proper integrated (multi-sectoral) spatial planning is the only approach that will support sustainable transport infrastructure and can prevent progressive isolation of wildlife populations and the decrease of their contribution to the production of ecosystem services.
- » Emphasize the need for adequate strategic environmental assessments in the early (pre-feasibility) planning phase, environmental impact assessments throughout the entire planning of programs/projects.
- » Support the basic philosophy of the Mitigation Hierarchy that “prevention is better than cure” – avoiding the negative effects of habitat fragmentation and traffic operations on wildlife is better than repairing or minimizing the damage.
- » Emphasize the need for reflecting not only social and economic costs and benefits in the option analysis of linear infrastructure plans, programs or projects, but also values of the natural capital, cultural capital and ecosystem services.
- » Underline that adjustments of national legislative tools may be necessary to effectively implement these principles.
- » Draw the attention to the importance of an integrated monitoring framework as part of the SEA and EIA processes and of monitoring the state of the biota in the defined territory before and during construction as well as in the operation phase for assessing the effectiveness of measures applied and supporting the science based solutions on mitigation, and
- » Emphasize the need to invest in the maintenance of ecological corridors and mitigation measures to ensure their coherence and functionality long after the construction phase is completed.

We welcome the results of related projects such as ConnectGREEN, AlpBioNET, Austria-Slovakia cross border Alpine-Carpathian Corridor, CEDR's Road & Wildlife transnational research and others, and express our willingness to sustain and apply the findings of those projects in the framework of future collaborative efforts towards harmonizing grey and green infrastructure in the Danube-Carpathian region.

TRANSGREEN Pilot Areas





TRANSGREEN Pilot Areas:

- 1. Beskydy - Kysuce**
- 2. Miskolc - Košice - Uzhgorod**
- 3. Arad (Radna) - Deva**
- 4. Tîrgu Mureş - Iaşi**

Tîrgu Mureş-Iaşi Pilot Area (Romania)

The Tîrgu Mureş-Iaşi Pilot Area in Romania is somewhat unique among TRANSGREEN's target locations. Construction work has not yet begun for the planned Tîrgu Mureş-Iaşi-Ungheni (A8) Highway. Moreover, the feasibility study of the planned highway needs to be revised and updated. Therefore, the infrastructure work is qualified as being in the **Early planning stage**. This gives the Association "Milvus Group", the pilot area leaders, an opportunity to intervene in a timely manner and to attempt to positively influence the planning process. Milvus is aiming to minimise the future highway's potential negative impacts on local communities, wildlife species and natural habitats of national and EU importance.



Key species:

The pilot area is a vital habitat for 3 large carnivore species - brown bear (*Ursus arctos*), grey wolf (*Canis lupus*) and Eurasian lynx (*Lynx lynx*), as well as for a number of other species and habitats of national and EU importance.



Steps taken under the TRANSGREEN Project:

The goal was to identify key future fragmentation hotspots where adequate mitigation measures would need to be implemented. Thus, efforts within TRANSGREEN were directed towards identifying functional ecological corridors and suitable habitats for a number of species (large carnivores, large herbivores, mesocarnivores...) that would be intersected by the planned highway.

The methodology consisted of long-term monitoring of the planned highway route with the help of camera traps. This approach had the advantage of being non-invasive, and useful in mapping large mammal species in extended areas with relatively little physical and time investment. The planned highway route was divided into 1 km-long segments, along which 1 motion-triggered camera/segment was installed at a distance of <100 m from the planned route. Cameras were placed in locations conducive for large mammal movements or in locations already indicated as suitable by the presence of tracks and other signs of the animals' presence. Each segment was surveyed for at least 1 month.

Number of photos



Photo results indicate a significant presence of mammal species

675 OF SMALL / MID-SIZED CARNIVORES

European wildcats, European badgers, red foxes, otters, beech martens, pine martens

3703 OF WILD UNGULATES

roe deer, red deer, wild boar



Photo © Milvus Association. One of the 273 brown bear (*Ursus arctos*) appearances captured by motion-triggered cameras.



Stage of the infrastructure project:

1

Scoping /
Early planning

2

Planning

3

Construction

4

Operation,
monitoring
& maintenance



Measure proposed:

Ideally, effective mitigation measures are incorporated into the highway's technical plans before the actual construction of the highway begins, thus ensuring that these costs are considered and measures are implemented from the very beginning.

Effective mitigation measures must be based on sound scientific data. Technical solutions (e.g. viaducts and bridges) implemented only because of topographic (or other, non-wildlife-related) considerations will not automatically benefit wildlife unless these are built in the right locations (on or close to functional ecological corridors). Moreover, these solutions must also meet a set of minimum requirements which make them adequate for wildlife crossings. In order to ensure a high permeability of the future highway, purpose-built wildlife crossing structures (for example, green bridges) need to be constructed in key locations on or close to functional ecological corridors or suitable habitats. Once the key locations are identified, the next step is to adapt standard technical parameters to local conditions. For example, standard highway fencing is easily climbed by brown bears or jumped over by red deer. In addition, garbage or roadside vegetation can attract a number of wildlife species close to or onto the highway, also putting both people and animals at risk.





© Wild Wonders of Europe, Cornelia Doerr, WWF

What does a motorway bring to the traditional inhabitants of the Carpathians?

For centuries, the Carpathians have been home to a rich biodiversity, but also to communities of people. People have shaped their lifestyles around what these mountains offered them: natural resources and especially wide open spaces important for such ancestral occupations as shepherding.

Although motorways are usually seen as “engines of development,” traditional communities can also face negative consequences such as limited movement, noise and air pollution. The topic of motorways cannot be depicted in black and white, but in various shades of grey. **No wonder they are called “grey infrastructure.”**

Miskolc-Košice-Uzhgorod Pilot Area (Hungary – Slovakia – Ukraine)

The Miskolc-Košice-Uzhgorod Pilot Area is located on the Hungarian-Slovak-Ukraine border and is an example of the **Planning Stage** of an infrastructure project. The site was selected due to the presence of ecological corridors, protected sites or Natura 2000 sites located along the areas that are in the transport infrastructure planning or construction phase.

A particularity of this pilot area is its transnational status: the Miskolc-Košice-Uzhgorod motorway network connects three countries. Consequently, three nations need to coordinate their efforts for ensuring wildlife connectivity. Even more problematical is that the infrastructure projects are at different stages of development in each of the three countries.



Landscape, key species and threats:

Forests, floodplain forests, grasslands, wetlands and agriculture fields cover the hilly landscape of this pilot area. Several nationally and internationally protected areas such as Natura 2000 sites and Ramsar sites indicate its great natural value.

Large mammals such as red deer, roe deer, fallow deer, wild boar and large carnivores are the most sensitive to the presence of transport infrastructure. The Slovak part of the area includes migration corridors for dispersal of large carnivores to Hungary.

Transport infrastructure also represents a barrier to many medium-sized mammals such as badger, otter, red fox, European hare and different species of Mustelids. There are also many wetlands in the area which create important habitats for large birds of prey, waterfowl and amphibians. Unfortunately, as a result of this proximity, high numbers of these birds are killed annually on the roads.

Other concerns that infrastructure plans raise in relation to nature in the pilot area:

- » habitat fragmentation;
- » biodiversity loss;
- » disruption of migration routes;
- » mortality caused by collisions; and
- » issues of noise pollution, emissions from vehicles and visual disruptions.



Stage of the infrastructure project:



In Hungary, there are new motorways planned from Vásárosnamény to Beregsurány (HU-UA direction) and from Miskolc to Tornyosnémeti (HU-SK direction). In Slovakia, there is the ongoing construction of the R2 expressway from Trenčín to Košice, the D1 motorway from Košice to Vyšné Nemecké (SK - UA border), and the R4 expressway from Haniska to Kechnec (SK - HU border, towards Miskolc).

	In preparation	Under construction	Constructed
Hungary	M34 motorway section between Vásárosnamény and Záhony HU-UA: M3 motorway section between Vásárosnamény and Beregdaróc (EIA is being prepared) extension to a 2x1 lane motorway	M30 road between Tornyosnémeti and the Slovak border M30 motorway between Miskolc and Tornyosnémeti	-
Slovakia	R2 - different stages of planning D1 Košice - Michalovce and Uzhgorod (UA)	D1 Motorway, section Budimír-Bidovce - will function as a bypass of the city of Košice. It will improve the connection between Košice, Eastern Slovakia and Hungary	D1 Košice-Bidovce R2 road - selected parts (40 km out of 230) R4 Košice and Milhošť - SK/HU border
Ukraine	Mukacheve - Beregove - Luzhanka (border crossing between Ukraine and Hungary), consisting of reconstruction of existing road (II category) between Mukacheve and Beregove, and construction of Beregove bypass. Lviv - Mukacheve - a new highway between Lviv and Mukachevo, so far without specification of exact location, but a pre-feasibility study is being carried out.	-	-



Measure proposed:

Conduct research and harmonise research results in order to support preparation of mitigation measures for wildlife connectivity in relation to roads and railways

When it comes to maintaining landscape connectivity, it is important to see the area as one entity. Due to the fact that each country relies on its own available specific data and knowledge, varied monitoring procedures, transport infrastructure planning processes and legislation, this presents a challenge. Therefore, TRANSGREEN project partners in each country collected information and analysed knowledge gaps in order to have a complete picture of the area, and to support further activities in a coordinated manner.

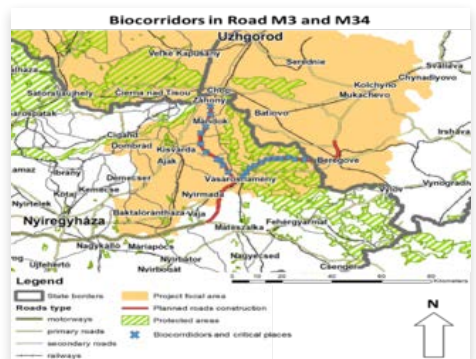
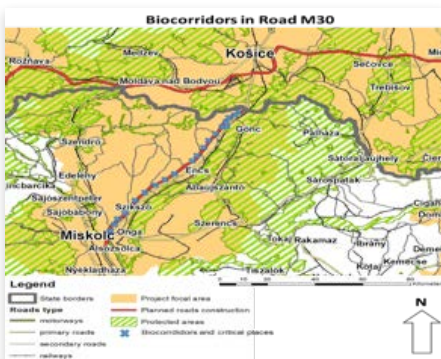
As a result, a list of recommendations was developed to fill in the gaps:

- » introduce harmonised data on animal mortality on roads and railways in one database;
 - » make GIS data available for free;
 - » develop more complex studies on wildlife movement, also in relation to roads and railways;
 - » make a map of migration corridors available; and
 - » communicate gaps in biodiversity data.
- » Migration corridors in the pilot area / critical points identified:

Migration corridors in the pilot area / critical points identified:

Hungary:

in general, the amount of data gained during the project was not sufficient for identification of corridors. However, the following maps indicate some previous knowledge about the existence of corridors.



Slovakia:

15 corridors/critical points were identified in the area by using data gained by camera trap monitoring and road/railway mortality mapping.



Brzotín Biocorridor in the Slovak part of the pilot area - tracks of red deer herd. ©Milan Olekšák



Krásnohorské Podhradie in the Slovak part of the pilot area. ©Ján Kilíkt

Ukraine:

5 corridors were identified.



Beregove - critical point in Ukraine.



Investigated road Mukacheve-Beregove. ©Andriy-Taras Bashta, 2018

Arad – Deva Pilot Area (Romania)

The Arad-Deva area was selected because the rehabilitation of the railway between Arad and Deva is located in the Mureş River Valley, one of the most sensitive areas in terms of connectivity. Furthermore, it is an important linkage zone within one of the most important European ecological corridors between the Apuseni Mountains and the Southern Carpathians (please see Map 1), and is already being affected by existing infrastructure and new one (the Lugoj- Deva motorway).

A study (Mot et al., 2010) based on identification of critical points represented by important permeable sectors of existing infrastructure, habitat suitability and land-use supported the designation of new Natura 2000 sites to form a regional ecological network in 2011.



Key species & threats:

It is not only large carnivores, key species at a regional level, which risk being affected by transport infrastructure. A whole range of mammals such as red and roe deer, wild boar, otter, beaver, wild cat etc.); birds; reptiles (Aesculapian Snake etc.); amphibians (Yellow-bellied Toad, Fire-bellied Toad, European Pond Turtle), fish, invertebrates. Their local habitats might be fragmented. Fish are particularly exposed, as the transport infrastructure is crossing their reproduction sites and refuges which are thus becoming unfit for their purpose.



Steps taken in TRANSGREEN project:

TRANSGREEN helped generate a more detailed mapping and assessment of various aspects such as permeability of existing linear features (transport infrastructure, rivers), presence of species (mixed methodology: transects, camera traps, observations and road-kill data), land use and local disturbance factors (with satellite imagery and field observations). Thirty-three study areas were analysed in order to identify and assess the functionality of mid-sized and large mammal movement routes.

A set of threats that might impact on structural and functional connectivity was identified for each species, and a list of potential mitigation approaches was proposed. For each study area, important sectors were acknowledged where concrete measures to ensure functional permeability are being proposed. These will be discussed with relevant stakeholders such as the state railway company, construction companies and their contracted environment specialists.



Stage of the infrastructure project:



The pilot area was selected because besides the construction of the motorway (which is in an advanced stage), an upgrade of the railway tracks is also underway. This presents the risk of a double barrier for wildlife movement. The project aimed to bring together decision-makers for both types of infrastructure (railway and motorway) so that they could coordinate ecological connectivity measures in a coherent landscape approach.



©Zarand Association



Measure proposed:

Improving construction details in order to maintain wildlife corridors and ensure landscape permeability that is resilient to changing factors, including the climate.

Nowadays, it is widely recognised that infrastructure represents a major driving factor of biodiversity loss and, as a result, it is required to assess, monitor and avoid/mitigate/compensate the environment impact of infrastructure projects.

However, it is crucial to understand the associated effects of infrastructure development on different phases (construction, operation), levels in relation with other sectors (development, land-use) and scale (cumulative impacts of other projects).

Ignoring the landscape level integrated approach incurs the danger that either the impact of a particular project will not be properly recognised and addressed, or that state of the art solutions implemented for a given project might become useless as their functionality is impacted by other factors.

Therefore, it is crucial to understand the project area in its dynamic from three perspectives: ecosystem, land-use and human development. As a next step, it is important to establish, monitor and adapt a system of measures for landscape permeability (transferred to each particular sector and project) that is resilient to changing factors (including the climate).

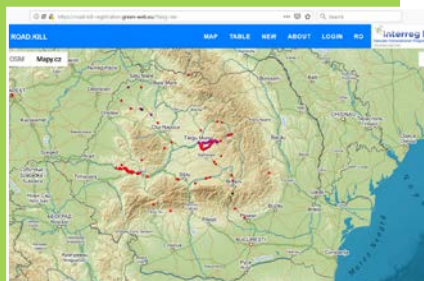




ROad.kill: the application that helps people and wildlife move more safely

Every day, unknown numbers of animals die on the roads and railways of Romania. The number of roadkill victims could range between tens and hundreds. No centralised database exists about these recurring accidents, neither about the species involved, nor the ratios.

The **ROad.kill website and application** (©2019, CDV & GreenWeb) was developed in order to help fill these information gaps. The app centralises Romanian roadkill data by creating a platform for users to report animal-vehicle collisions or dead animals. Each new entry is a valuable piece of a puzzle that our teams of researchers are compiling in order to better understand the patterns and circumstances behind these accidents. Regular reports are being collected and the data will be published on the website.



ROad.kill is a collaborative tool intended for a variety of users: drivers, road and rail administrators, police, insurance companies, biologists, environmentalists, hunters, foresters and the general public.

ROad.kill was developed within TRANSGREEN by CDV (Transport Research Centre, Czech Republic, [link](#)) and supported by GreenWeb. It can be accessed [here](#) or downloaded from Google Play.

Kysuce - Beskydy Pilot Area (Slovak Republic - Czech Republic)

The Kysuce - Beskydy Pilot Area is located on the Czech-Slovak border and is a good example of the **Operation and Maintenance Stage** of an infrastructure project.

Once the infrastructure is built, regardless of the existence of mitigation measures to improve landscape permeability, continuous monitoring is essential. Monitoring provides information on the actual use of the passage structures by animals. It is then possible to assess if the connectivity is ensured or whether more measures need to be taken to better guarantee the safety of both people and animals. New measures might need to be introduced, either in the form of small investments such as installing warning signs or repairing fencing; or through substantial interventions like building new ecoducts. The Kysuce -Beskydy Pilot Area offers examples of both of these types of measures.



Key species and ecological connectivity:

This pilot area is especially known for the presence of large carnivores. There are 15 designated **Sites of Community Importance** (NATURA 2000 sites) for the protection of lynx, wolf and bear. This particular landscape owes its extraordinary aesthetic value to the historical coexistence humans and the mountainous ecosystem. The area is also known for its species-rich meadows and pastures, as well as its remnants of old-growth beech forests. Ecological corridors for selected specially protected large mammal species have already been identified in this area. From the connectivity perspective, there are several sections of these corridors which are crucial, and therefore it is essential to keep the transport infrastructure in these sections permeable.



Steps taken in TRANSGREEN project:

Monitoring of traffic intensity patterns on roads in critical sections of ecological corridors

Goal: to determine traffic flow characteristics & duration of permeable conditions = time gaps between passing vehicles allowing animals to cross

Method: monitoring traffic patterns (traffic intensity) by detection devices SIERZECA SR-4. For each vehicle there were recorded: time of passage, speed, travel direction, length.

Duration: September-October 2017. 168 hours per locality (5 work days, 1 Saturday, 1 Sunday)

Locations: 38 localities on 3 types of roads, selected with local wildlife experts

Results:

Road type	Traffic Intensity median (min - max) vehicles/24 h	Permeability for wildlife crossing median (min - max)	
		Day	Night
1st class roads included in European system (ACR agreement) (10 localities)	10901 (3770-29645)	0,1% (0%-12%)	48% (7%-70%)
Other 1st class roads (16 localities)	5503 (740-13547)	3% (1%-54%)	81% (63%-96%)
2nd and 3rd class roads (12 localities)	3438 (934-12544)	15% (1%-47%)	91% (60% - 97%)

Monitoring existing underpasses and overpasses

Goal: mapping migration permeability (usability) of existing Green Infrastructure (GI) objects, namely underpasses and overpasses

Factors considered:

- » the type of structure and its dimensions (openness index) (technical parameters)
- » terrain type either on or underneath the structure
- » location
- » type of surroundings
- » disturbance factors eg. presence of barriers in the vicinity

Method: Field inspection and photo documentation

Status: ongoing - till 12/2018

Locations: 415 objects were visited and documented up to date (July 2018)



Stage of the infrastructure project:



Measures proposed:

Installation of warning signs “Beware of Wildlife” on main critical sections of ecological corridors

Improvements in road safety and landscape permeability can also be achieved by installing suitable road signs. “Beware of Wildlife” signs alert drivers to pay better attention and slow down in given areas. In the Kysuce - Beskydy Pilot Area, 17 sections of selected roads were identified as critical for large mammal crossing in the Czech Republic, and 27 in Slovakia. In the Czech Republic, these sections were reported to relevant District Authorities. As a result, seven 70 km/h speed limit warning signs were posted.



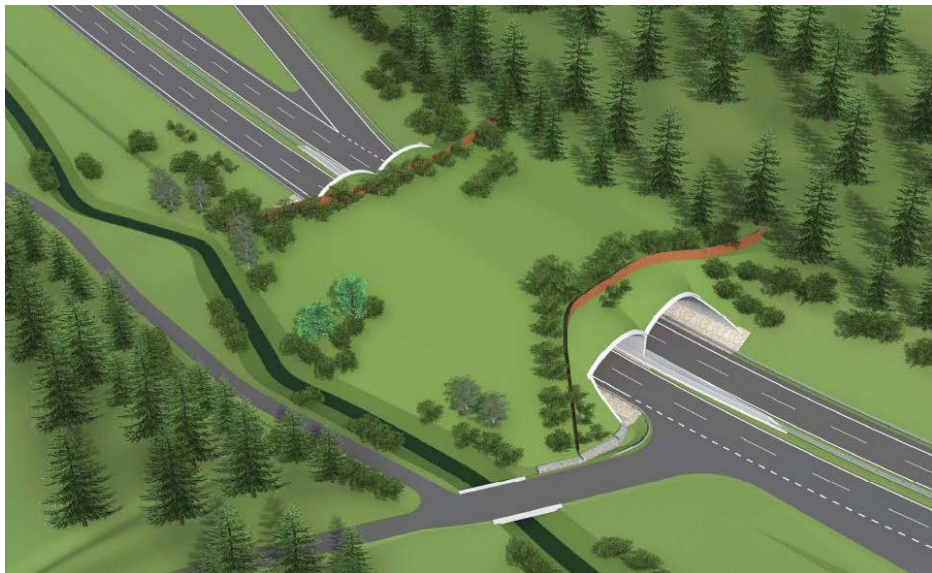
Measures proposed:

Construction of ecoducts as compensation and mitigation measures

Results of long-term monitoring confirmed the importance of the area between the towns of Mosty u Jablunkova (CZ) and Svrčinovec (SK) for large carnivore migration. Eventually, the construction of two ecoducts (one at each side of the CZ-SK border) was proposed as a mitigation measure to safeguard landscape permeability for large mammals. This proposal is the result of intense efforts by many stakeholders involved in the protection of this area, including NGOs, public administrations and relevant ministries. TRANSGREEN contributed to the continuation of these efforts, and its partners also provided arguments in favour of the “green bridge” solution during two international Czech-Slovak meetings organised by the Czech Ministry of Environment and the Slovak Ministry of Transport and Construction. Consequently, the Czech Road and Motorway Directorate (ŘSD) provided an ecoduct plan for consultation in July 2018. On the Slovak side, the construction site for the D3 Svrčinovec ecoduct has already been chosen, and its design is being discussed among relevant stakeholders.

Planned ecoduct features:

- » Location: 49.4960186N, 18.7647825E, in Mosty u Jablunkova near the Czech-Slovak border.
- » 47 m wide to accommodate large mammal migration
- » suitable fencing for leading the animals across the bridge
- » no asphalt cover for the adjacent forest road



Visualisation of proposed plan for Mosty u Jablunkova ecoduct © Planning documentation of Czech Road and Motorway Directorate 2018

Otmar.

Or how a lynx gets its name

Naming a lynx may take months - the complex mission to identify a new inhabitant of the Beskydy Mountains.

Jiří Labuda, a volunteer at the Olomuc branch of Friends of the Earth - Czech Republic had the once in a lifetime opportunity to name a lynx that he identified in the north-eastern part of the Beskydy Protected Landscape Area, a place where lynx had been absent for several years.

Jiří Labuda first spotted the lynx in November 2017 with the help of a camera trap. However, this evidence was not enough. He needed to define a full profile based on its side whiskers, body structure and the markings on its fur. He then started his seven-month long detective work by putting together pieces of a puzzle involving archive photos and data from several colleagues in the region, as well as monitoring tracks in the snow and further camera trap evidence.

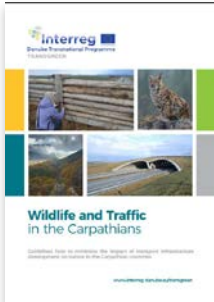
When he was sure of the identity of the lynx, Jiří Labuda had the privilege to name it Otmar, corresponding to the name day on the Czech calendar corresponding to the date when it was first spotted - November 16th. The name Otmar means "rich and happy," or "famous." Jiří Labuda hopes that it will continue to thrive and to be a happy and "rich" master of its new territory. He also wishes Otmar good luck in avoiding bullets from poachers and road traffic.



Photos ©Friends of the Earth, Czech Republic, Olomuc branch

Tools for sustainable transport planning developed within TRANSGREEN

TRANSGREEN contributed tools that support integrated transport planning to regional and national efforts already underway. These tools included publications such as:



Wildlife and Traffic in the Carpathians. Guidelines How to Minimise the Impact of Transport Infrastructure Development on Nature in the Carpathians. The State Nature Conservancy of the Slovak Republic. English, Czech & Ukrainian versions available.



Ghid privind integrarea măsurilor de conservare a biodiversității în planificarea, pregătirea, evaluarea, implementarea și monitorizarea proiectelor de transport rutier și feroviar. WWF-Romania. Romanian adaption of the above Guidelines.



Preparation of an Environmental Impact Assessment Report for Road Construction: Methodology Manual. WWF-Ukraine. Ukrainian adaptation of the above Training Package.



State of the Art Report and Gap Analysis in the Field of Environmentally friendly Transport Infrastructure Development. WWF-Romania. English version.

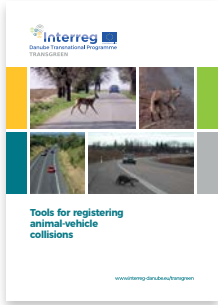


Keeping Nature Connected - Environmental Impact Assessment (EIA) for Integrated Green Infrastructure Planning - Training Package. Milvus Association & EPC. English and Romanian versions

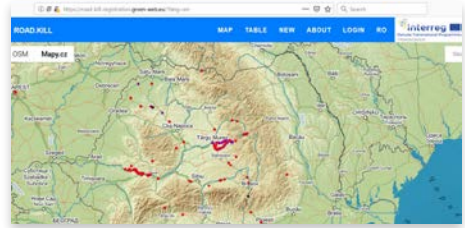


TRANSGREEN Policy Recommendations on Integrated Road and Rail Transportation in the Carpathians. The State Nature Conservancy of the Slovak Republic & WWF-CEE. English version.

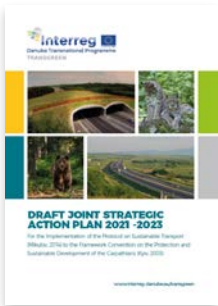
All publications are available for download on the homepage of the project website, under the **Outputs section** <http://www.interreg-danube.eu/approved-projects/transgreen/outputs>



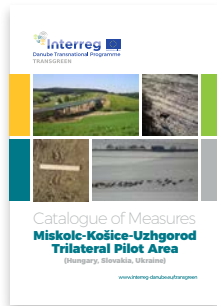
Tool for Registering Animal-Vehicle Collisions. Transport Research Centre, CZ. English version.



ROad.kill website and application. <https://road-kill-registration.green-web.eu> CDV & GreenWeb. English and Romanian versions



Draft Joint Strategic Action Plan 2021 - 2023 for the Implementation of the Protocol on Sustainable Transport (Mikulov, 2014) to the Framework Convention on the Protection and Sustainable Development of the Carpathians (Kyiv, 2003)



Catalogue of Measures Miskolc-Košice-Uzhgorod Pilot Area (Hungary, Slovakia, Ukraine). CEEweb, SNC, WWF-Ukraine. English, Slovakian and Ukrainian versions



Catalogue of Measures in the Tirgu Mures-Iasi Pilot Area (Romania). Milvus Association. English, Romanian and Hungarian versions



Catalogue of Measures Beskydy-Kysuce Cross-border Area (Slovak Republic, Czech Republic). Nature Conservation Agency of the Czech Republic, State Nature Conservancy of the Slovak Republic. English and Slovak versions



Catalogue of Measures Arad - Deva Pilot Area (Romania). WWF-Romania, Zarand Association. English version



CCIBIS database. www.ccibis.org



Project Partners

Austria – WWF Central and Eastern Europe (former WWF DCP, project lead)

Czech Republic – Friends of the Earth Czech Republic – branch Olomouc, Nature Conservation Agency, Transport Research Centre

Hungary – CEEweb for Biodiversity

Romania – Association “Milvus Group”, WWF Romania

Slovakia – National Motorway Company, State Nature Conservancy of the Slovak Republic, SPECTRA – Centre of Excellence of EU – Slovak University of Technology in Bratislava

Associated Strategic Partners

Austria – Ministry for Transport, Innovation and Technology

Czech Republic – Ministry of the Environment

Hungary – National Infrastructure Developing Private Company Ltd.

Poland – Ministry of Infrastructure and Construction

Romania – Ministry of the Environment, Ministry of Transport

Slovenia – Ministry of Infrastructure

Ukraine – Ministry of Ecology and Natural Resources, Transcarpathian Regional State Administration – Department of Ecology and Natural Resources

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