



# INTEGRATED TRANSPORT PLANNING

## How to avoid cumulative impacts on nature for overlapping infrastructure projects



Mureș valley from the top of the future tunnel for the new railway, overlooking existing infrastructure (old railway line, European Road) and the forested hills of Zarand Mountains ©Zarand Association

**PILOT AREA:**  
Arad – Deva  
(Romania)

**Stage of the infrastructure project:**

**1** Scoping /  
Early planning

**2** Planning

**3** Construction

**4** Operation,  
monitoring &  
maintenance

The pilot area was selected because an additional infrastructure development is under way (an upgrade of the railway) besides the construction of a motorway, which is in an advanced stage. This brings the risk of a double barrier for wildlife movement. The project aims to bring together decision-makers for both types of infrastructure (railway and motorway) so that they coordinate the measures taken for ecological connectivity, as a coherent landscape approach.

### Measure proposed

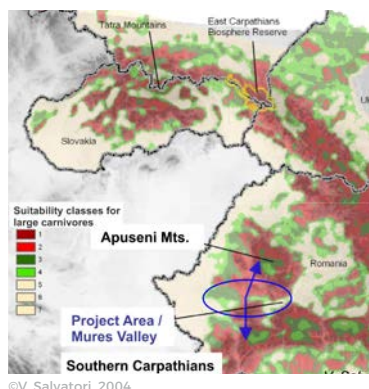
**Improving construction details in order to maintain wildlife corridors and ensure landscape permeability that is resilient to changing factors, including the climate.**

Nowadays it is widely recognized 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 impact of infrastructure projects on environment.

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 scales (cumulative impacts of other projects).

By not having an integrated approach at landscape level, the danger is that either the impact of a particular project is not properly acknowledged 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 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).



**Map:** Focus on ecological corridors in Mureș valley

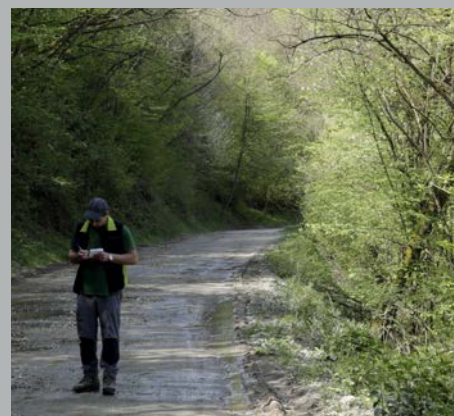
## Pilot area: Arad - Deva (Romania)

The Arad-Deva area was selected as a pilot-area within TRANSGREEN project as the upgrade of the railway between Arad and Deva is located in one of the most sensitive areas in terms of connectivity: the valley of Mureș river, an important linkage zone within one of the most important European ecological corridors - the one between Apuseni Mountains and Southern Carpathians (please see Map), already affected by existing infrastructure and new one (the Lugoj- Deva motorway).

A study (Moț 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 (bear, wolf, lynx), key species at a regional level, which risk being affected by transport infrastructure, but also a whole range of other animal species forming the local biodiversity: mammals (red and roe deer, wild boar, otter, beaver, wild cat etc.), birds, reptiles (Aesculapian Snake, European Pond Turtle etc.), amphibians (Yellow-bellied Toad, Fire-bellied Toad), fish, invertebrates. Fish are particularly sensitive as their local habitats could be fragmented as the railway is crossing their reproduction sites and refuges which are thus becoming unfit for their purpose.



Observations of amphibian and mammal species along the new railway alignment ©Zarand Association

## Steps taken in the first stages of Transgreen project

TRANSGREEN project helped with a more detailed assessment and mapping of different aspects as: permeability of existing linear features (transport infrastructure, rivers), presence of species (different methods: transects, camera-traps, observations and road-kill data), land use and local disturbance factors (with satellite imagery and field observations). 33 study-areas are being analysed in detail in order to identify and assess the functionality of movement routes of mid-sized and large mammal species.

A set of threats that might impact on structural and functional connectivity has been identified and, for each, a list of potential approaches to mitigate the conflict has been proposed. In each study area important sectors were identified where concrete measures to ensure functional permeability are being proposed and will be discussed with relevant stakeholders as Railway Company, Construction companies and their contracted environment specialists.