

Wildlife and traffic in the Carpathians

Guidelines how to minimize impact of transport infrastructure development on nature
in the Carpathian countries

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www.interreg-danube.eu/transgreen

Wildlife and traffic in the Carpathians

- One of the main outputs of the **TRANSGREEN** project

other TRANSGREEN outputs:

- State of the Art Report
- Catalogue of measures
- In-depth analysis
- Policy Special Recommendations for sustainable transportation in the Carpathians
- EIA training package for sustainable transportation in the Carpathians

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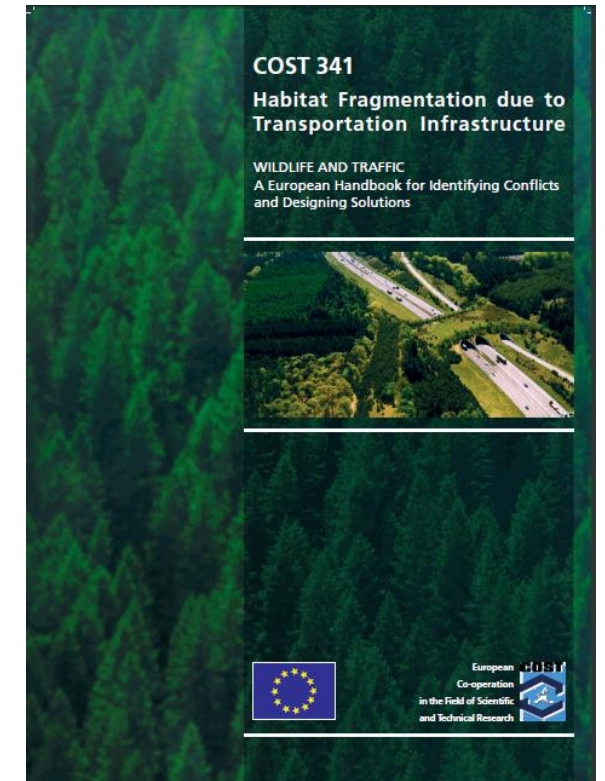
why do we need it?

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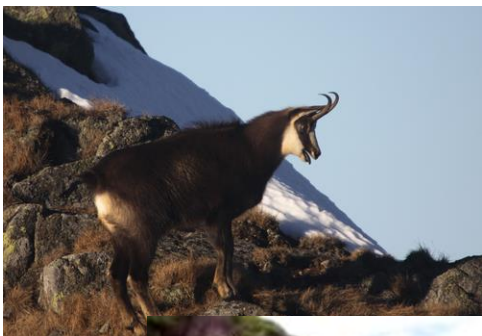
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why do we need it?



From a European perspective the Carpathians are still an area of extreme natural beauty and unique richness of biodiversity



Carpathians - still low-fragmented area - the last true wilderness in Central Europe with thriving populations of large carnivores and many other species



Mountain environment is more sensitive than other types of landscape



Transportation had proceeded in the traditional way there for centuries, but times are changing



Building of new transport infrastructure, growing intensity of traffic and spreading of new development go very fast also in Carpathians



Rapid development brings fragmentation of habitats and populations. The process is usually irreversible



Our knowledge is progressing, but the impact of transport on fauna is growing



....sometimes the measures are placed in the wrong places, sometimes are badly done, sometimes the fauna has not been taken into account at all



We usually start to solve the problem when it is too late



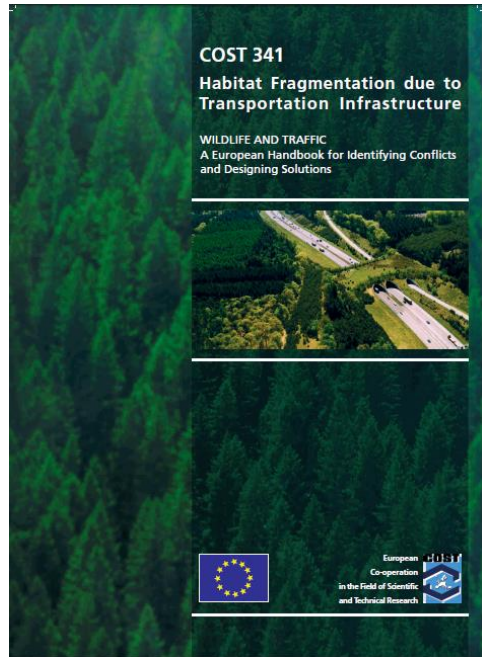
We usually start to solve the problem when it is too late

- **Rapid development of transport infrastructure can be expected in Carpathian countries in coming years**
- **There is a lot of experience in Europe how to minimize the negative environmental impacts of transport**
- **We have a unique opportunity to use this European experience, avoid the mistakes that have been made and develop the transportation infrastructure in the Carpathians in a sustainable way**



Content:

1. Introduction
2. Users' Guide
3. Basic Term
4. Effects of transport infrastructure on nature
5. Specifics of the Carpathian countries
6. Biota and ecological connectivity, demands of different groups of fauna on infrastructure permeability
7. Legislative aspects
8. Basic steps and processes for ensuring ecological connectivity within transport infrastructure development
9. Integration of linear transport infrastructure into the surrounding landscape
10. Fauna passages and other technical solutions
11. Ecological compensation
12. Monitoring the impact of transport on nature



Recommended distances between the fauna passages for the main categories of fauna in different types of the Carpathian habitats

| Type of habitat | Categories of fauna passages | | | Recommended portion of functional fauna passages (of total length of the infrastructure) [%] |
|--|--|---|-------------------|--|
| | For large mammals | For medium-sized mammals | For small mammals | |
| <i>alpine and subalpine grasslands</i> | 3-5 km in core areas, outside of those at the crossings of the transport infrastructure with the migration corridors | 2-5 km | 1-2 km | 20-30 |
| <i>forests</i> | | 2-5 km | 1-2 km | 2-3 |
| <i>dry grasslands and pastures with shrubs</i> | | 3-8 km | 1-2 km | 2-3 |
| <i>wetlands</i> | | 3-8 km | 1-2 km | 10 (according to local conditions) |
| <i>agriculture landscape</i> | | 5-10 km | 1-2 km | 1 |
| <i>urban areas</i> | | according to local conditions | 1-2 km | according to local conditions |
| <i>watercourses</i> | | all watercourses must be kept permeable, dry banks preferably built on both sides | | |

Probability of use for fauna underpasses in relation to their dimensions

| Openess Index* | Example of dimensions: w x h / l [m] | <u>Functionality for different fauna categories</u> | | |
|----------------|---|---|--|--|
| | | Small mammals (\leq fox/badger) | Medium-sized mammals (<u>roe deer</u> , <u>wild boar</u>) | Large mammals (red deer, moose, large carnivores) |
| 0.1 - 0.7 | 3 x 2 : 30 | Minimal | Not functional/ Blockage | Not functional/ Blockage |
| 0.7 - 1.5 | 10 x 3 : 30 | Medium | Minimal | Not functional/ Blockage |
| 1.5 - 2.0 | 13 x 4 : 30 | Good | Medium | <u>Minimal</u> |
| 2.0 - 4.0 | 20 x 5 : 30 | Very good | Medium | Minimal |
| 4.0 - 8.0 | 30 x 6 : 30 | Very good | Good | Medium |
| 8.0 - 40.0 | 50 x 20 : 30 | Very good | Very good | Good |
| > 40.0 | 70 x 25 : 30 | Very good | Very good | Very good |

*Openess Index = $w \times h / l$ (w - width of the underpass, h - height, l - length)

Monitoring standards:

Monitoring the impact of traffic on wildlife – Parameters and time schedule

| Type of construction | Main focus of monitoring | Minimal monitoring period* |
|--|--|---|
| <i>New constructions</i> | three-phase monitoring* | 2 - <u>yes</u> - 2 |
| | impact of construction (noise, soil and water pollution) | 0 - 0 - 2 |
| <i>Upgrading (e.g. fences, barriers)</i> | three-phase monitoring* (according to real needs) | 2 - x - 2 |
| | fauna traffic mortality | 2 - x - 2 |
| <i>Fauna passages</i> | efficiency | 0 - 0 - 3 (subsequently every fifth year) |

* Nr. of years before – during – after the construction

x – optional monitoring

Monitoring effectiveness of fauna passages – recommended methods for individual categories of species

| n. | Animal category | Common methods of monitoring |
|----|---|--|
| 1 | Terrestrial invertebrates | Special monitoring methods are used for individual groups of invertebrates, their description is beyond the scope of this handbook. If this animal category is the subject of monitoring, monitoring methods have to be proposed by an appropriate expert on the given species (group of species). |
| 2 | Fishes and other aquatic animals | Monitoring the use of fish crossings: fish telemetry, camera and detection systems Monitoring species composition and age structure of populations by electrofishing |
| 3 | Amphibians | Monitoring mortality on critical road sections Visual inventory of amphibians migrating along barriers Visual inventory of amphibians migrating through an amphibian tunnel Capture-recapture method (marking individuals on one side, control capture on the other side) |
| 4 | Reptiles | Visual control of suitable habitats in suitable weather conditions Checking potential hiding spots including artificial ones Monitoring mortality |
| 5 | Birds | |
| 6 | Terrestrial mammals up to the size of fox and badger | Cameras and phototraps Recording animal tracks on beds of sand, mud or powdered marble (only underpasses) Recording footprints with ink beds (only underpasses) Snow tracking Monitoring mortality on roads |
| 7 | Otter and other semiaquatic animals | Cameras and phototraps Checking for signs of residence (excrements, markings) under bridges over watercourses Monitoring tracks on snow and mud Monitoring mortality on roads |
| 8 | Mammals living on trees | Cameras and phototraps |
| 9 | Bats | Using bat detectors (devices able to record ultrasound displays of bats and to determine species based on that) Comparison of number of flights over a motorway and using an overpass or underpass |
| 10 | Medium-sized mammals | Cameras and phototraps Tracking on snow and mud |
| 11 | Large mammals | Cameras and phototraps Tracking on snow and mud Telemetry Genetic analyses (recommended) Monitoring mortality on roads |

Current state of preparation:

- text content is complete
- proofreading is in progress
- we add the latest pictures and case study
- layout work begins
- will be published in English, Czech / Slovak, Ukrainian and perhaps in Romanian language by the end of June



Next challenge:

to implement recommendations into process of preparation and implementation of transport infrastructure in the Carpathians



Thank you for your attention

