



ENVEROS

ENVIRONMENTAL EDUCATION THROUGH
ROADKILL OBSERVATION SYSTEMS

2018-1-CY01-KA204-046919

<http://www.enveros.eu/>

Environmental Education through Roadkills Observation Systems - EnVeROS

10. Best Practices



TRANSPORT
RESEARCH
CENTRE



LEARNING OBJECTIVES

At the end of this topic students should be able to:

- Summarize best practices for Wildlife Vehicle Collisions (WVCs) monitoring and mitigation.
- Design monitoring methods for WVCs and road ecology studies.
- Plan WVCs mitigation measures.
- Develop management plans for WVCs in their areas of interest.

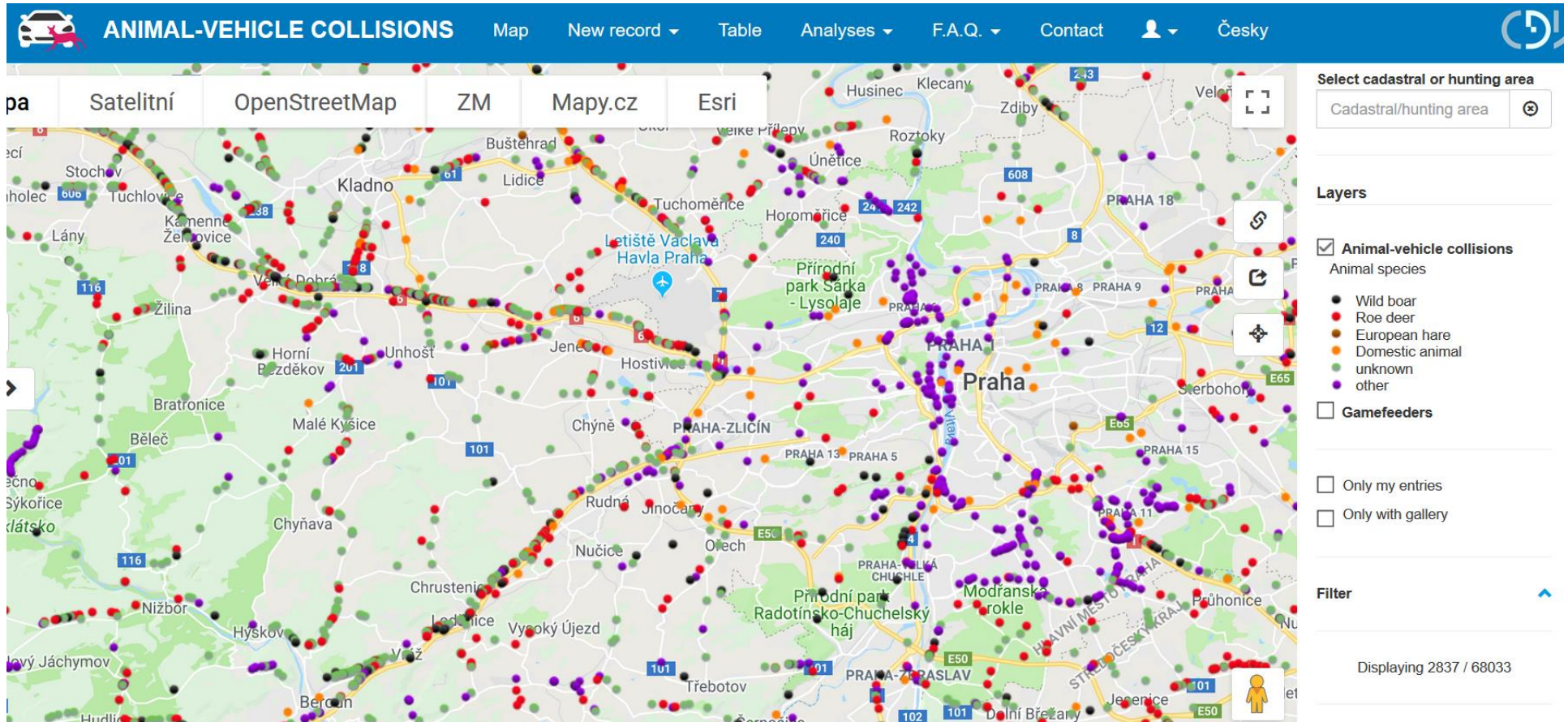


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1. Monitoring - CDV; Czech Rep.



WVCs locations in Czech Rep. monitored with the system developed by CDV

(Source: Bíl, M., Kubeček, et al., 2017; *Biological Conservation*)



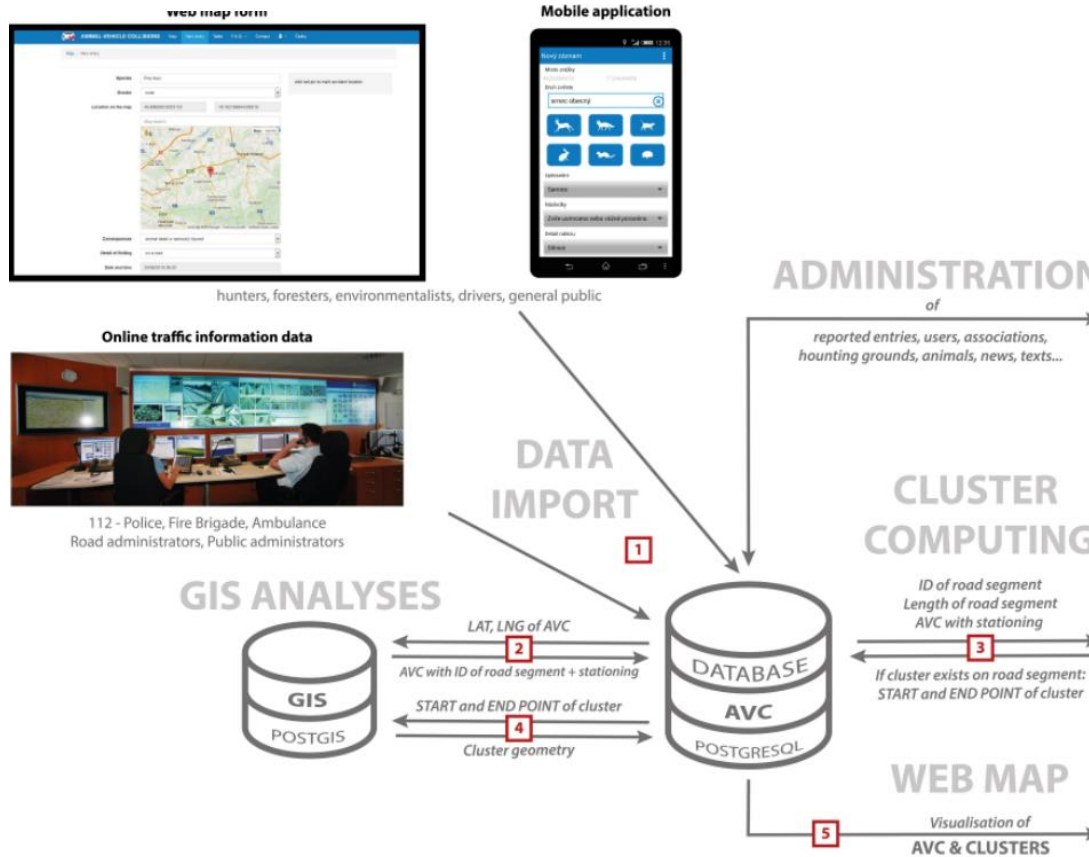
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Click the image below to see how the system works

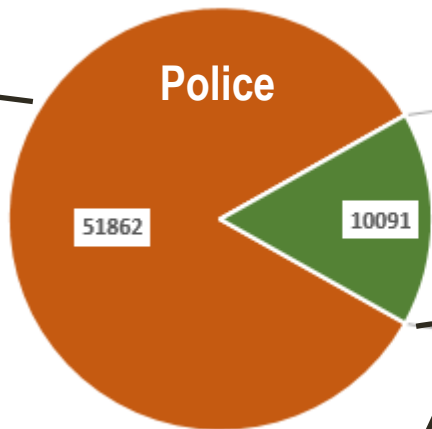
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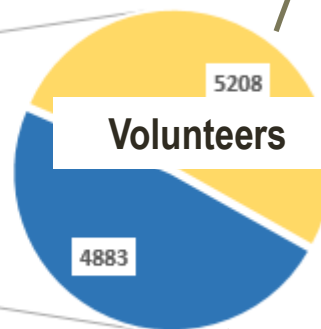
1. Data import could be done using a smartphone or pc.
2. All records are stored in a database.
3. Analysis and mapping is performed using the GIS.
4. WVC hotspots are determined using the KDE+ methodology.
5. CDV is responsible for the administration of this system

Who is adding data?

Traffic crashes
with animals



Citizen
science
(roadkill)



Volunteers and
NGO



ČSO
Czech Society
for Ornithology

AOPK ČR
Nature Conservation
Agency of the
Czech Republic

Hunters

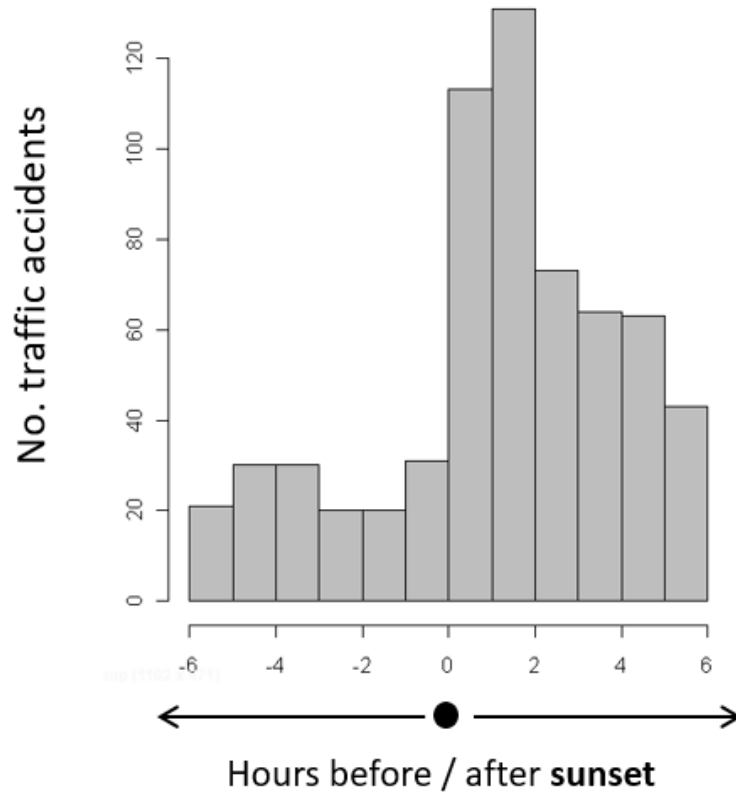




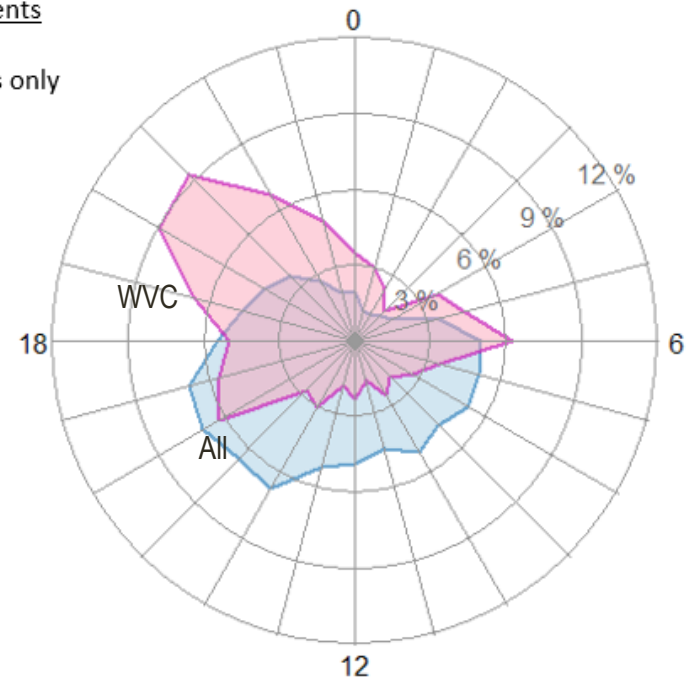
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Analyses and animations

Visit: www.srazenazver.cz/en/animation/



Traffic accidents
All database
With animals only

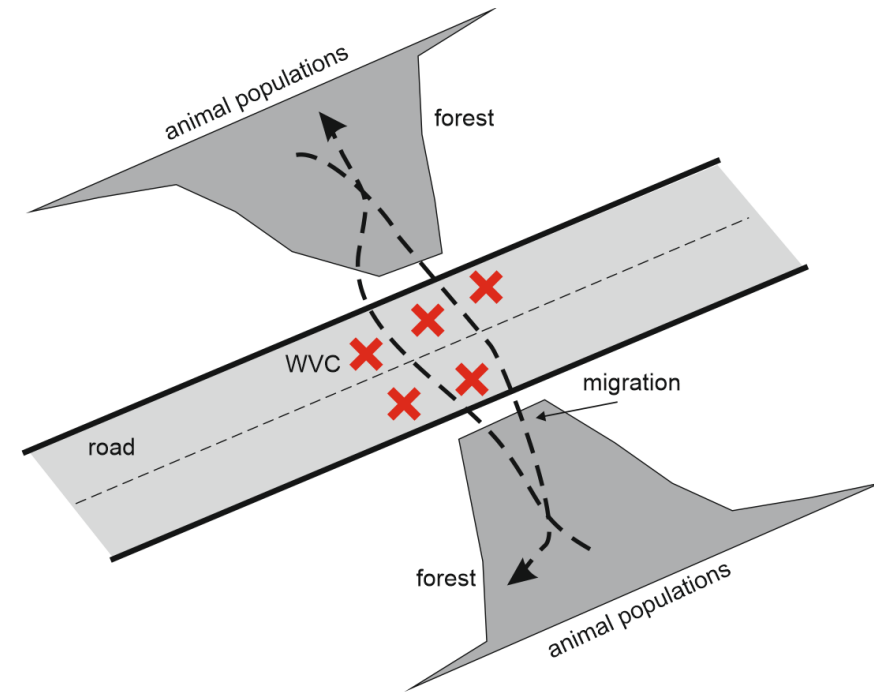
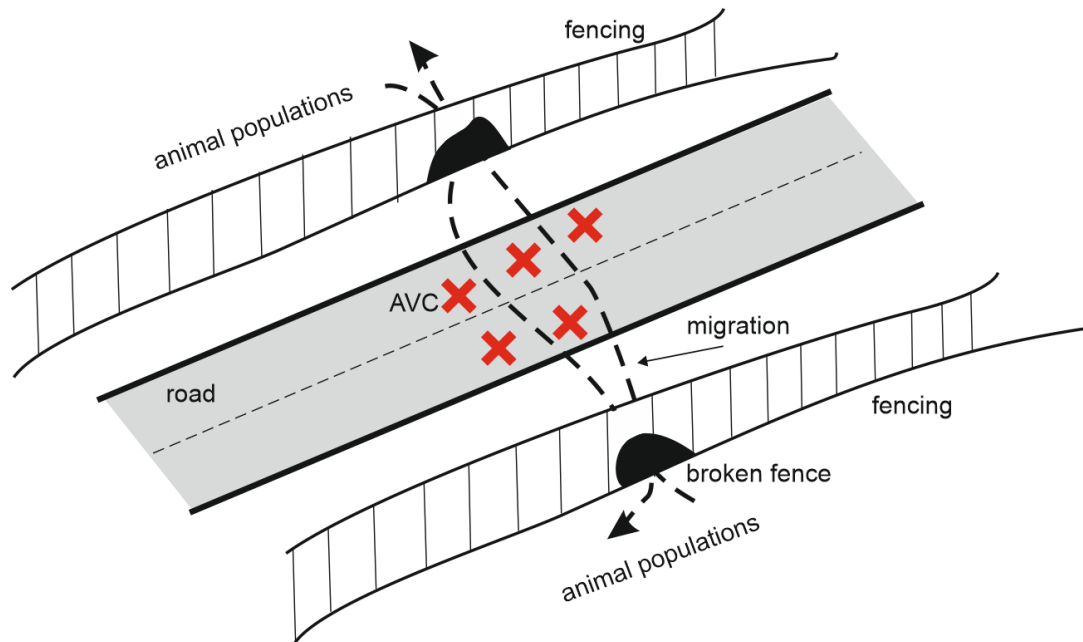


Many accidents are happening within the first hours after sunset.



Contribution to the mitigation of AVC

Many times the WVC hotspots are located in places where fencing is damaged or in places where forests are intersected by the road network.





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2. Mitigation (Antonín Krása – NCA)

Amphibians and reptiles road related mortality mitigation - Nature Conservation Agency (NCA) of the Czech Republic



Common Toad (*Bufo bufo*)



Common Spadefoot
(*Pelobates fuscus*)



Fire Salamander
(*Salamandra salamandra*)



Smooth Newt (*Lissotriton vulgaris*)



Dice Snake (*Natrix tessellata*)



Common Frog (*Rana temporaria*)

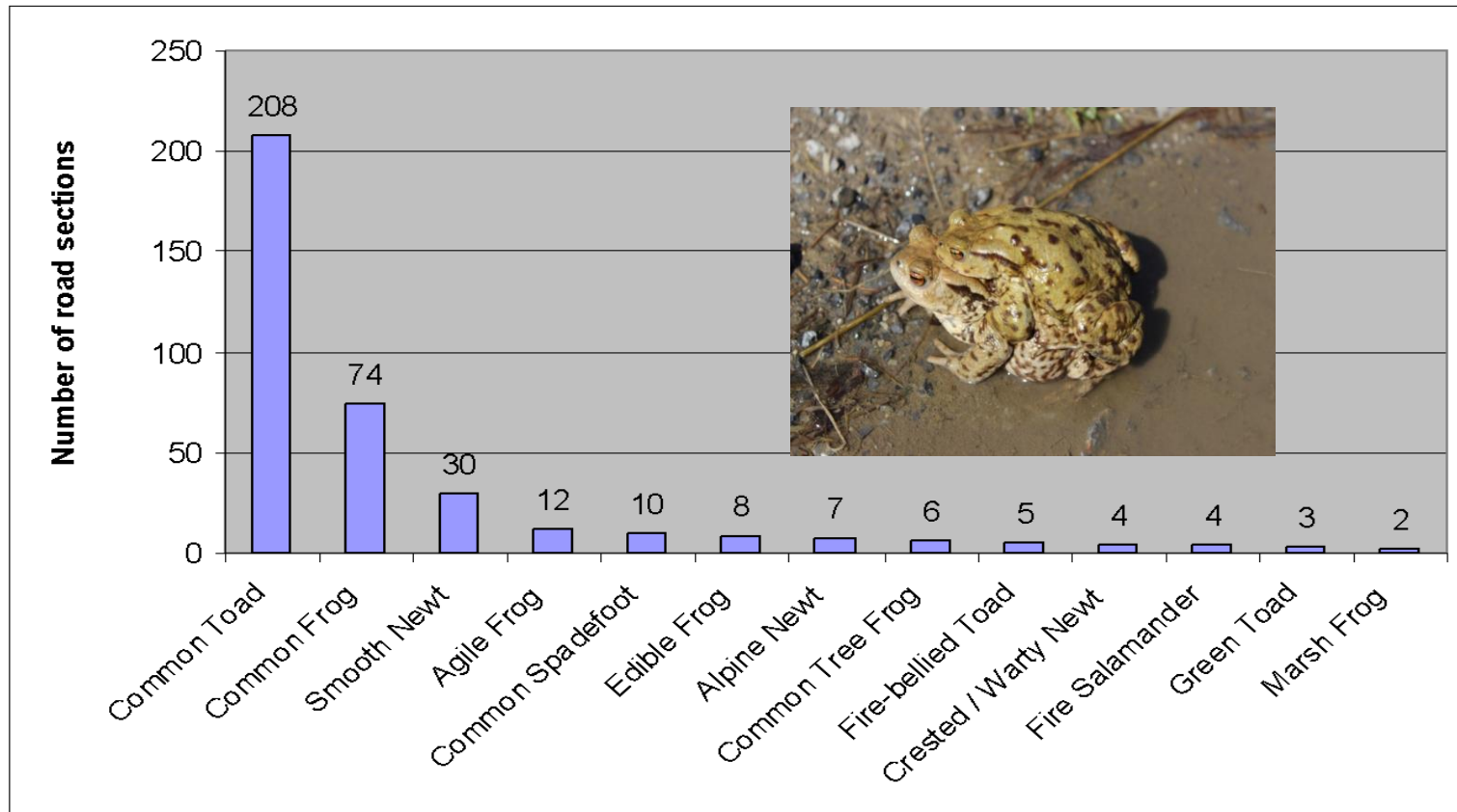
Herps affected
by the road
mortality



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Species affected by the road mortality – data from Czech Rep.





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Important WVC data (road sections)

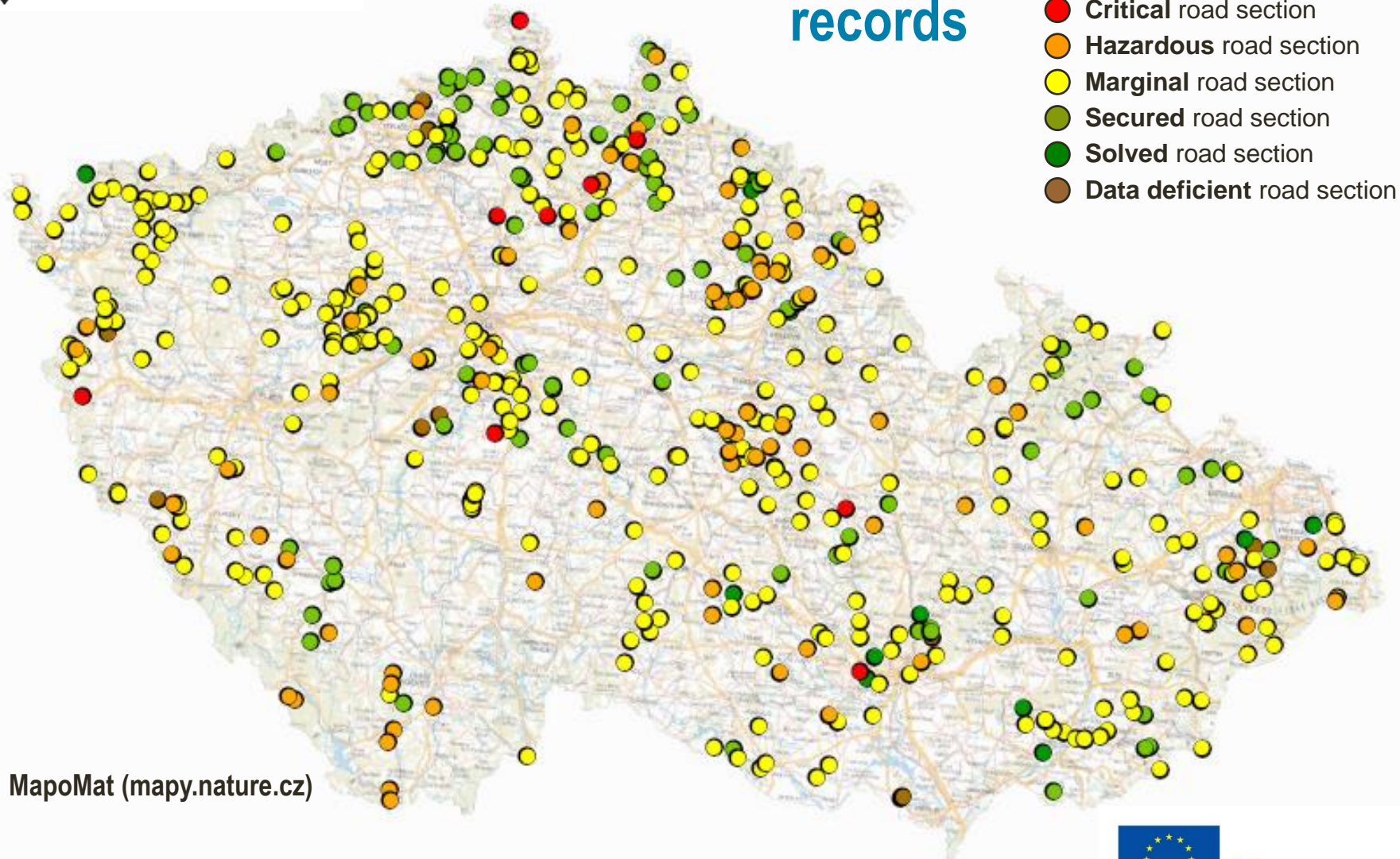
- Animals **migrating** (magnitude)
- Animals **killed** (magnitude)
- **Mitigation measure**
- **Efficiency** of mitigation measure
- Road section **evaluation**





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Evaluation of road sections based on the amphibian and reptile road mortality records



Mitigation measures and efficiency

➤ Mitigation measure (MM)

- None
- Traffic signs
- New breeding pond
- Collecting and transfer
- Temporary barriers (photo)
- Permanent barriers (PB)



➤ Efficiency of MM

- Low (survival rate <25 %)
- Medium (s. r. 25 – 90 %)
- High (s. r. >90 %)





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Permanent barriers evaluation

- **only 20 Road Sections (RS)** (3 % out of 582) with permanent barrier (PB)
- **12 are well working** (only 1 excellent: Žebětín)
- **5 are bad: 3 hazardous and 2 critical**
- PB building is not enough – **maintenance is strongly needed**
- Regular **evaluation is important First step**



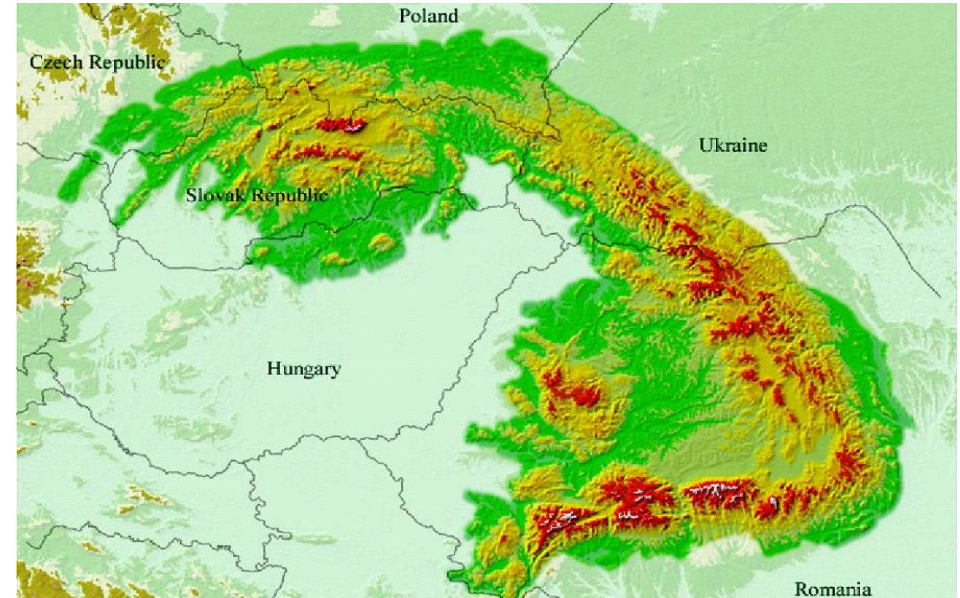


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3. Planning (Transgreen project - Ivo Dostál - CDV)

Carpathians – major mountain range in seven countries



- Duration: 2017 - 2019
- 11 PPs from 5 Carpathian countries + 9 ASPs
- Lead partner: WWF International Danube-Carpathian Programme (Wien)
- <http://www.interreg-danube.eu/approved-projects/transgreen>



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Natural values, biodiversity



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**Modern transport infrastructure is on the rise causing habitat losses, barrier effect
and also direct animal mortality.**



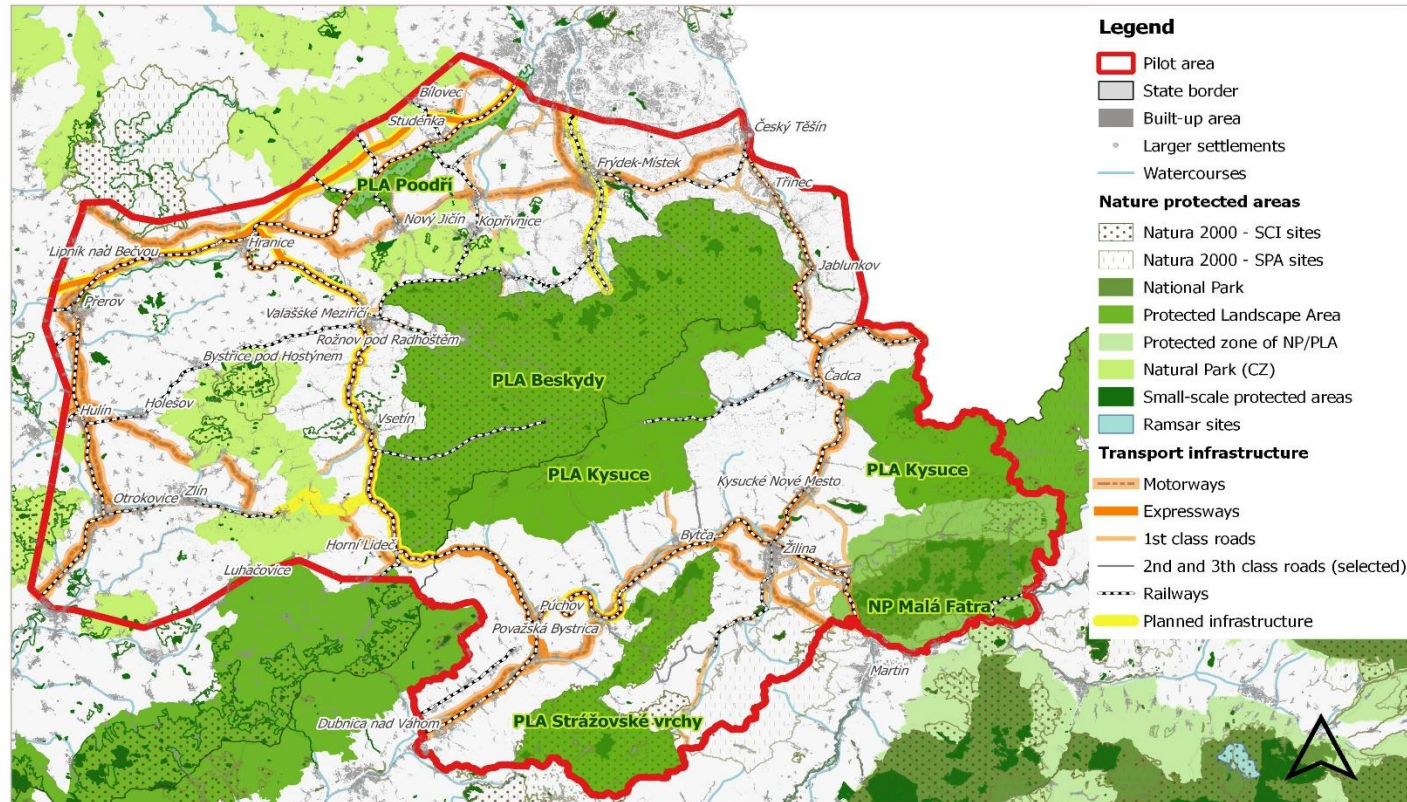


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Czech part of the pilot area “Beskydy”

Kysuce - Beskydy pilot area



Legend

- Pilot area
- State border
- Built-up area
- Larger settlements
- Watercourses
- Nature protected areas**
 - Natura 2000 - SCI sites
 - Natura 2000 - SPA sites
 - National Park
 - Protected Landscape Area
 - Protected zone of NP/PLA
 - Natural Park (CZ)
 - Small-scale protected areas
 - Ramsar sites
- Transport infrastructure**
 - Motorways
 - Expressways
 - 1st class roads
 - 2nd and 3th class roads (selected)
 - Railways
 - Planned infrastructure

Pilot areas

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© Prispievatelia OpenStreetMap, © DIVA-GIS
Tematické spracovanie © Štátna ochrana prírody SR, 2018 a AOPK ČR, 2018



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Project actions



- **Migration permeability of transport infrastructure for fauna** – field inspection and inventatization of all structures in roads and major railways from the width 5 m
- **Usage of under- and over-passes by animals** – photo traps monitoring on selected structures
- **Monitoring of populations** – aimed to Lynx
- **Animal mortality on roads/railways**
- **Road Network Permeability at Conflict Points with Wildlife Corridors** – detailed traffic patterns and analysis of permeable time based on gaps between vehicles

Mortality monitoring

- Intensive: selected sections of roads – 1y monitoring in pilot area. frequency 1 visit/2w
- Extensive: other activities in pilot area (eg permeability monitoring); PLA employees during their other duties
- Extra data: biological databases of NCA CZ



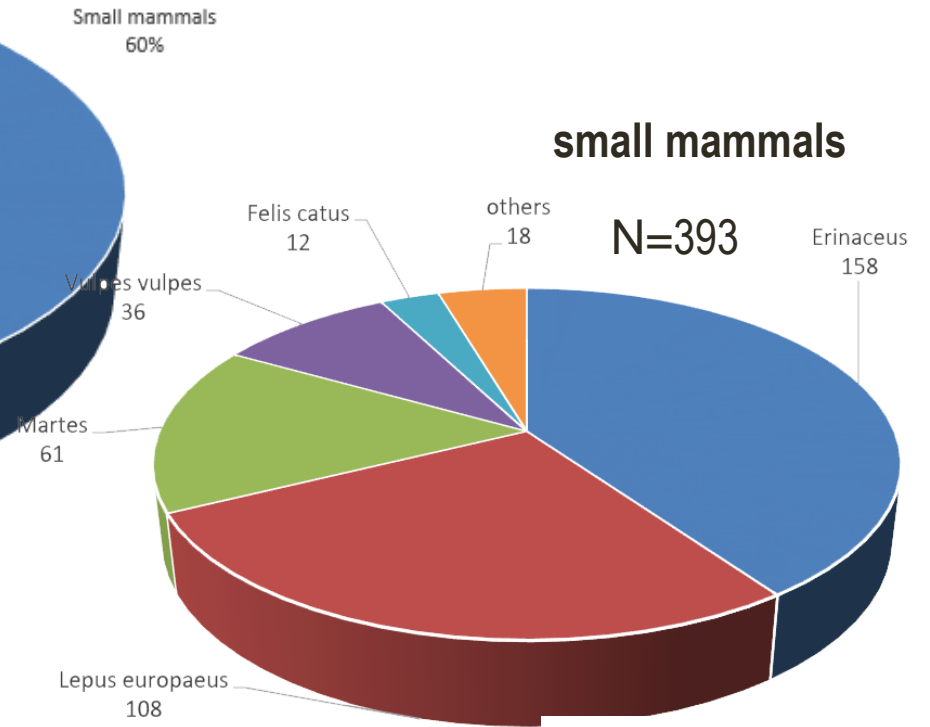
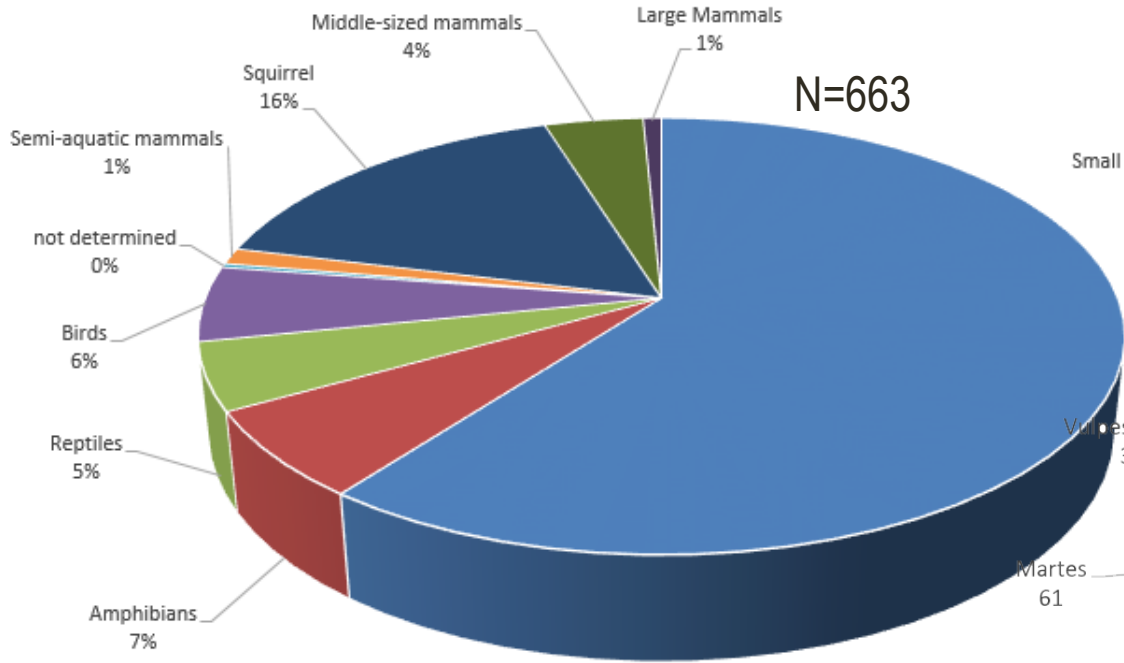
foto: Dana Bartošová





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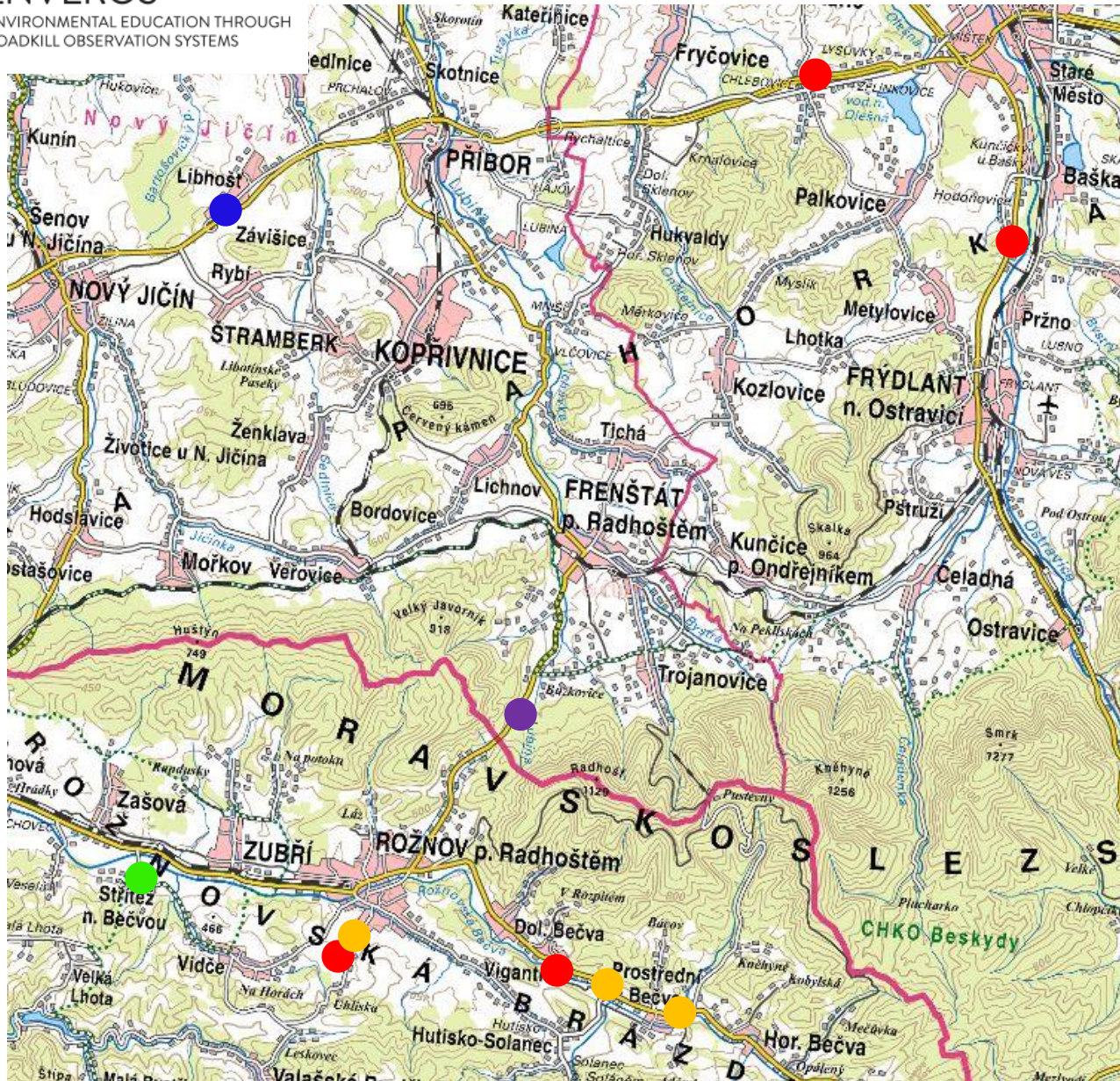
Mortality monitoring





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WVC clusters (KDE+)

- mammals
- rodents
- fox, marten
- hare
- birds



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Conclusion for Beskydy area

- Problem of the ecological corridors and landscape permeability for wildlife in Beskydy was underestimated for many decades
- Planning requirements are not always strictly followed
- There is lack of good passages in roads and railways except new constructions
- Few remaining possibilities for large mammals' migration and ...
- ... these are at risk to be interrupted by construction of a new infrastructure or other anthropogenic development

Summary

- The number of good practices which look either holistically or at key aspects of WVCs are on the increase.
- Cooperation among various stakeholders in a country level is essential for operating ROSs, such as that used in the Czech Republic (CDV).
- Implementation of measures, such as the barriers presented, require available funding and knowhow, continuous monitoring and evaluation of the obtained mitigation results.
- In a larger scale, transnational cooperation is required, as that established in the TransGreen project, for the effective monitoring and mitigation of the effects of roads on ecosystems.



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Selected references

- Bíl, M., Kubeček, J., Sedoník, J., & Andrášik, R. (2017). Srazenazver. cz: A system for evidence of animal-vehicle collisions along transportation networks. *Biological conservation*, 213, 167-174.
- Transgreen Project: <http://www.interreg-danube.eu/approved-projects/transgreen/outputs>
- Antonín Krása, 2019. Amphibians and reptiles road related mortality mitigation. Presentation in the EnVeROS joint staff training event in Brno, 5-7 July. Available upon request (antonin.krasa@nature.cz)



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Activities & Self assessment exercises:

- In a small paragraph, explain how the monitoring method is working in Czech Republic. Find more information here <http://www.srazenazver.cz/en/about> (100 words).
- Build your own small project in 10-15 slides in PPT to reduce WVC. You must include: **Problematic area** (description of area and which animals involved in collisions), **methodology of monitoring** (information would you suggest to be included in the monitoring system for better results) and **mitigation measures** (depending on the animals).