ARE GREEN BRIDGES LOCATED OFF THE MOTORWAY NETWORK IN LOWER AUSTRIA A JUSTIFIED SOLUTION FOR ENHANCING PERMEABILITY FOR MAMMALS?

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1 INTRODUCTION

Linear infrastructure in Europe is continuously increasing (Eurostat 2022), which is linked to a higher proportion of landscape fragmentation and an increase in vehicle-wildlife collisions (WVCs). WVCs represent a serious problem in terms of traffic safety and cause considerable economic damage, also injury or death to people and wildlife every year (Fig. 1). Future predictions point to further global growth in transport infrastructure (Laurance et al. 2014). Currently, there is an increasing need for testing and feedback of mitigation measures already applied. Green bridges (Fig. 2) as applied mitigation measure are specific structures with a nature-like surface built above infrastructure with higher traffic (Iuell et al. 2003). Their functionality is often discussed by a wide range of stakeholders.

Figure 1. A victim of WVC of the European Badger

Figure 2. Green Bridge near Mistelbach

2 AIMS OF THE STUDY

- Evaluate functionality and permeability for mammals on selected green bridges located off the motorway in Lower Austria
- Compare different factors affecting the permeability
- Suggest optimization for the future

3 MATERIAL AND METHODS

- Study focuses on 8 green bridges (multiuse overpasses) off-motorways in Lower Austria near Mistelbach, Retz and Maissau (Fig. 3)
- Green bridges of interest have been built relatively recently (2005-2015)
- Average traffic under the sites of interest is about 9000 vehicles per day (Straßenmeisterei Retz, pers. comm. 2022), for instance 2-3 less compared to motorways
- Green bridges have a similar structural design (vegetation strip and a dedicated road)
- Automatic photo traps with IR illumination were used for monitoring
- The photo traps were placed in the middle of the bridge
- Planned monitoring duration: January - December 2022
- Nearly 16,500 records in total evaluated so far
- Data are evaluated in terms of species, human activity, abundance, date, time, direction of movement, position of the animal on the object, etc.
- Comparison with other green bridges located on motorways is planned

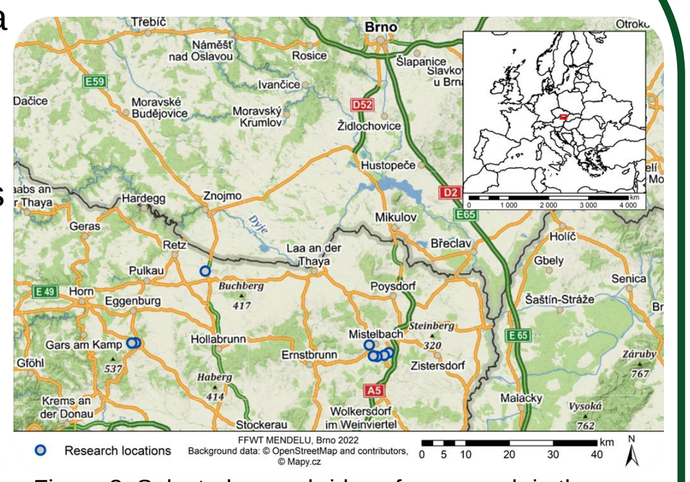

Figure 3. Selected green bridges for research in the region of Lower Austria

Figure 3. Roe deer (*Capreolus capreolus)*

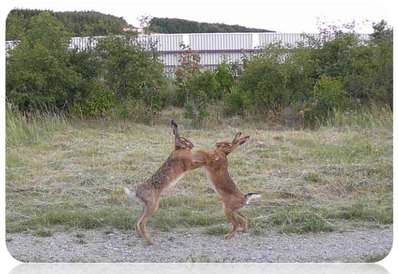

Figure 4. European hare (*Lepus europaeus*)

Figure 5. Red fox (*Vulpes vulpes*)

Figure 6. European badger (*Meles meles*)

4 PRELIMINARY RESULTS

- 7 species of mammal passage recorded (incl. domestic cat)
- more human activity records (53.6 %, Fig. 8) than wildlife records (46.4 %, Fig. 7)
- The most commonly recorded mammals incl. roe deer, hare, fox and marten, which are among the most common victims of WVCs (Statistik Austria 2022).

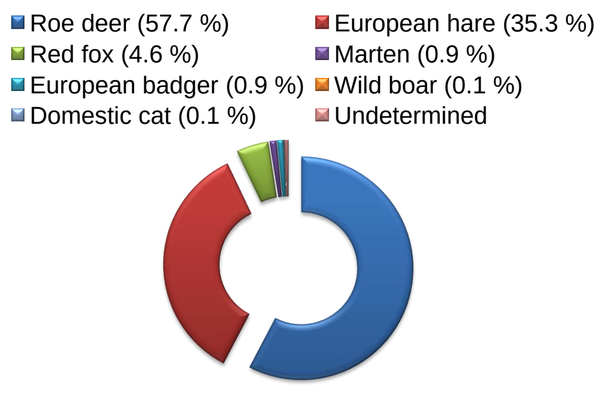

Figure 7. Overall mammal activity records (n=7541)

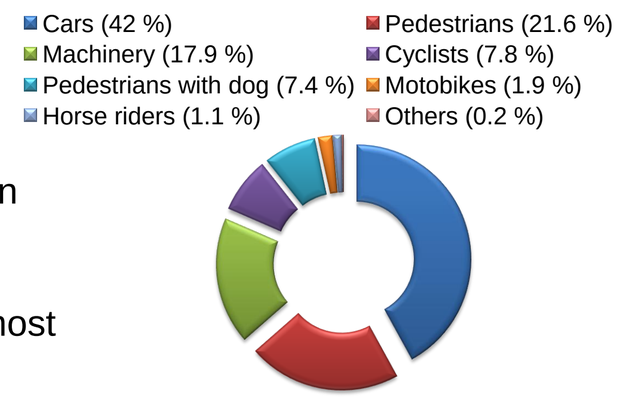

Figure 8. Overall records of human activity (n=8711)

4 CONCLUSION

- Preliminary results suggest that green bridges are permeable to common mammals of the cultural landscape
- This measure represents a compromise for maintaining the permeability of the landscape for wildlife while contributing to increased traffic safety.
- Further studies are needed given the increasing trend of WVC

REFERENCES

EUROSTAT., 2022. Road transport. Available from https://ec.europa.eu/eurostat/web/transport/data/database. Version from 7. 11. 2022.

IUELL, B., et al. Wildlife and Traffic-A European Handbook for Identifying Conflicts and Designing Solutions. Prepared by COST 341-Habitat Fragmentation due to Transportation Infrastructure.-Ministry of Transport. *Public Works and Water Management, Road and Hydraulic Engineering division, Delft, The Netherlands*, 2003.

LAURANCE, William F., et al. A global strategy for road building. *Nature*, 2014, 513.7517: 229-232.

STATISTIK AUSTRIA. Jagdstatistik 2021/2022. Bundesanstalt Statistik Österreich, Wien, 2022.

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