

Virtual Rail-Fence

A wildlife accident prevention system for rail



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Wildlife accidents are a worldwide problem and we help to prevent them



The WiConNET Projekt

Project duration 2017 – 2023



The **WiConNET** project was initiated by **bmvit** and **FFG** to improve the technical protection measures. iPTE Traffic Solutions was commissioned to develop the components and to manage the project.

Project Issuer

- **FFG** (Research Promotion Agency)
- **bmvit** (Austrian Ministry for Traffic, Innovation and Technology)



Contracting Parties

- **ÖBB INFRA** (Austrian Rail Infrastructure)
- **ASFINAG** (Austrian Highways)
- **The 9 Austrian Federal States** (National roads)



Project partners

- **iPTE Traffic Solutions** (Project lead)
- **AIT** - Austrian Institute of Technology
- **WWN - Forstner** (wildlife biologist)



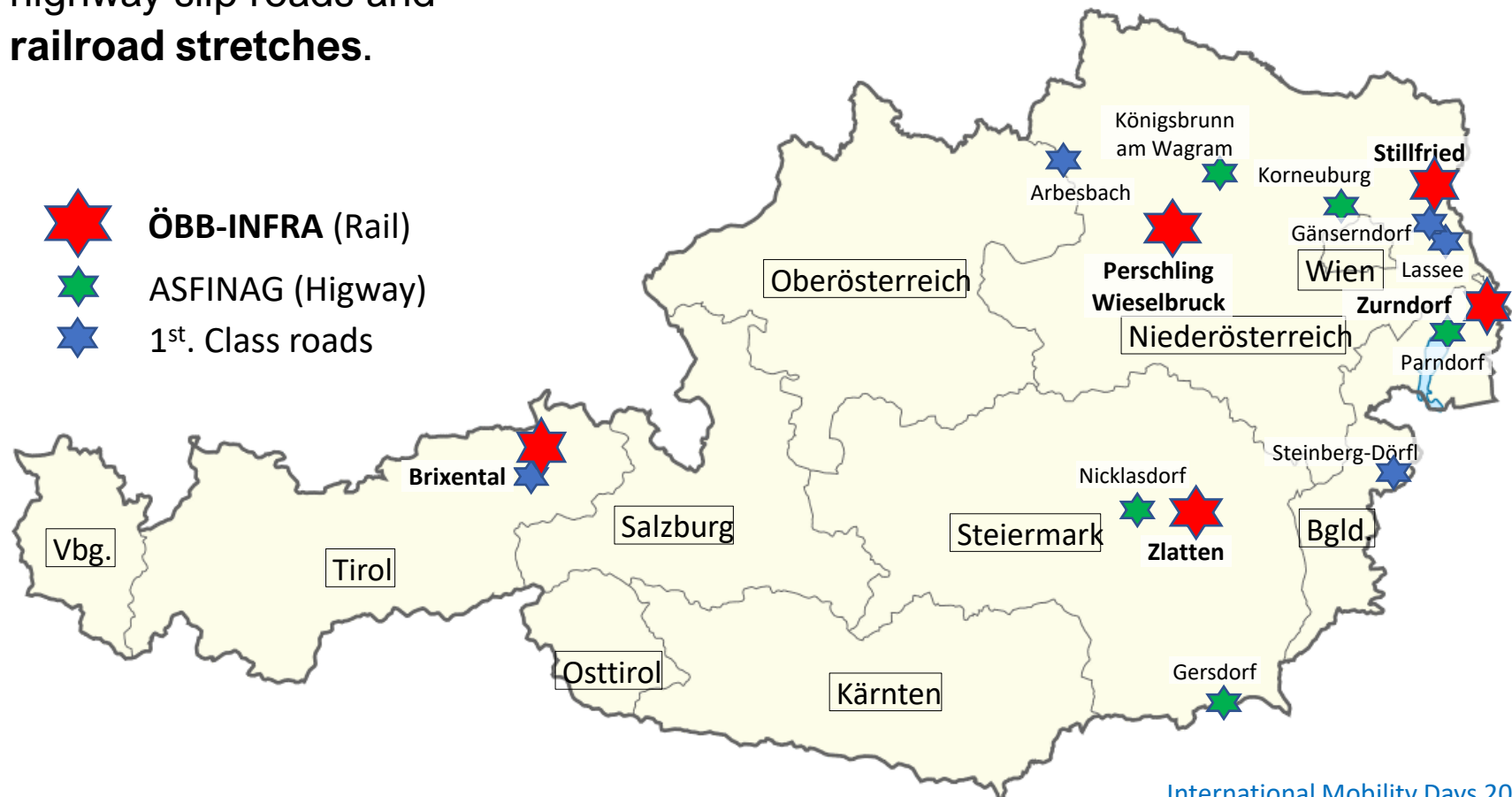
WiConNET–Testsites in Austria

To validate the newly developed systems, test sites were set up in WiConNET:

5 regional roads

5 highway slip roads and

5 railroad stretches.



iPTE development: Virtual Rail-Fence

New WEB-based warning system for train routes



Train routes with travelling speeds of more than 80 km/h cannot be protected from wildlife accidents with conventional wildlife warning systems.

The requirements for monitoring the function of the system are also much higher on the railway than on the road.

For this reason, iPTE has developed a completely new WEB-connected warning system with **remote trigger** and **internet gateway**.



Wieselbruck test site
Travelling speed up to 250 km/h

The DD461 Rail - How does it work?

The DD461 Rail

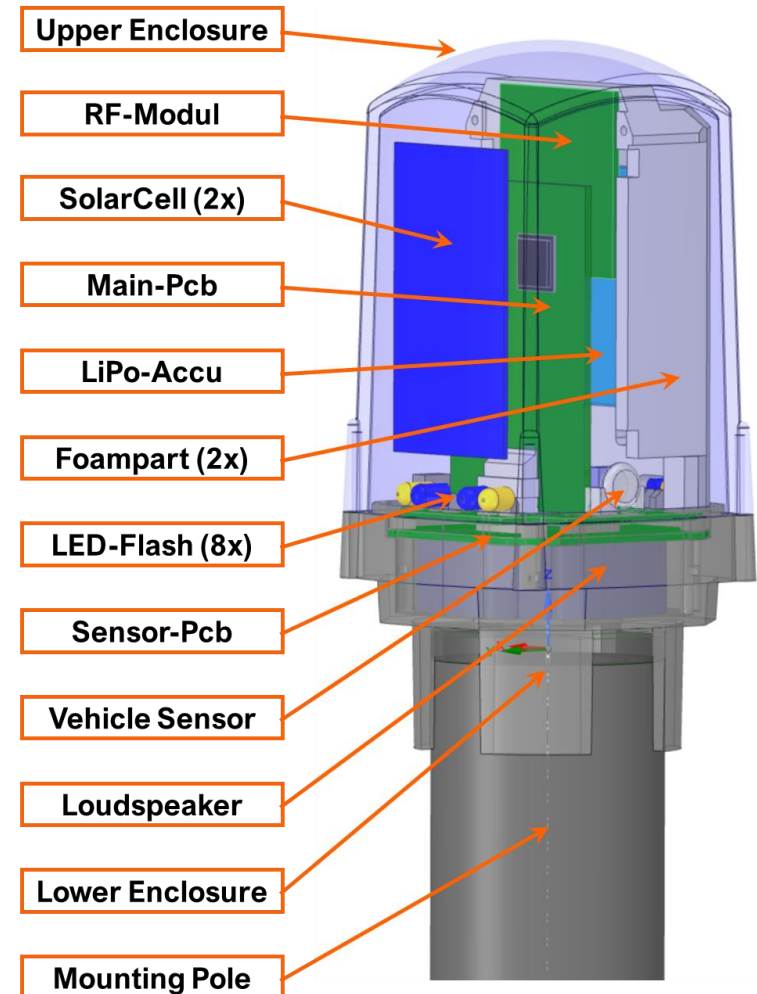
is the first sales product out of the **WiConNET** Project.

The system is lightweight (about 5kg including pole and base), cost efficient (12-20k€ per km) and easy to deploy, as it does not need power supply digging.

It is energy autonomous by its solar panels and high performance LiPo buffer batteries.

Up to 40 devices are wirelessly interconnected in groups and its wildlife alerts are activated by optical or thermal or radar remote trigger device.

The DD461 may be connected to the Internet by a DD601 Gateway for remote control and service.



Advantages of the DD461 Rail

The **DD461 Rail** was developed in a cooperation within the WiConNET by iPTE Traffic Solutions and ÖBB-INFRA.

It has a much improved wildlife alert system

- 10 times stronger audio alert (93dB vs. 82dB)
- Powered by 2 solar panel
- Contains 2 LiPo batteries
- Intense LED flashes (8 vs. 2 LEDs)
- It is working on 2 sides, so the deployment can be on just one side of the rail-track. This makes the deployment safe and possible without closing the traffic.
- Is directly fitting on the mounting pole so the full rollout/setup can be done in 5 minutes/device
- It may be equipped with an audio system that emulates human voices, dog-barking etc.



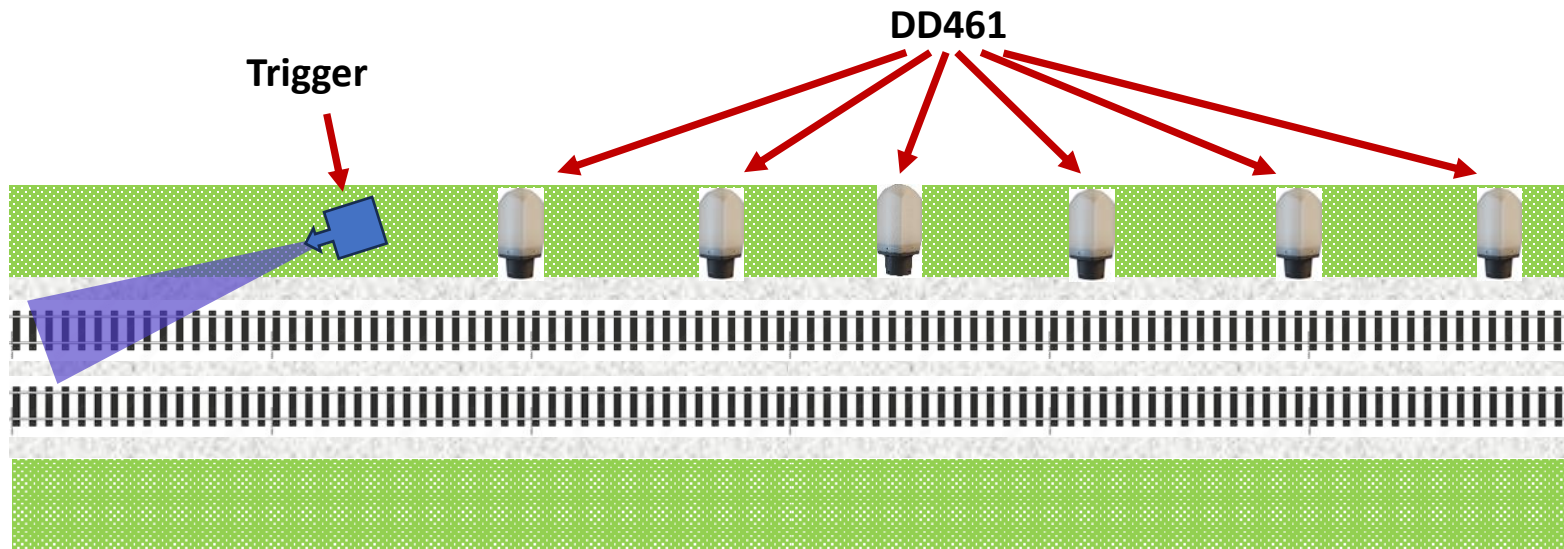
How does the Virtual Rail-Fence works?



How does the Virtual Rail-Fence works?

The Virtual Rail-Fence consists of a group of wirelessly connected DD461 devices and a remote trigger.

The remote trigger is constantly monitoring the track.

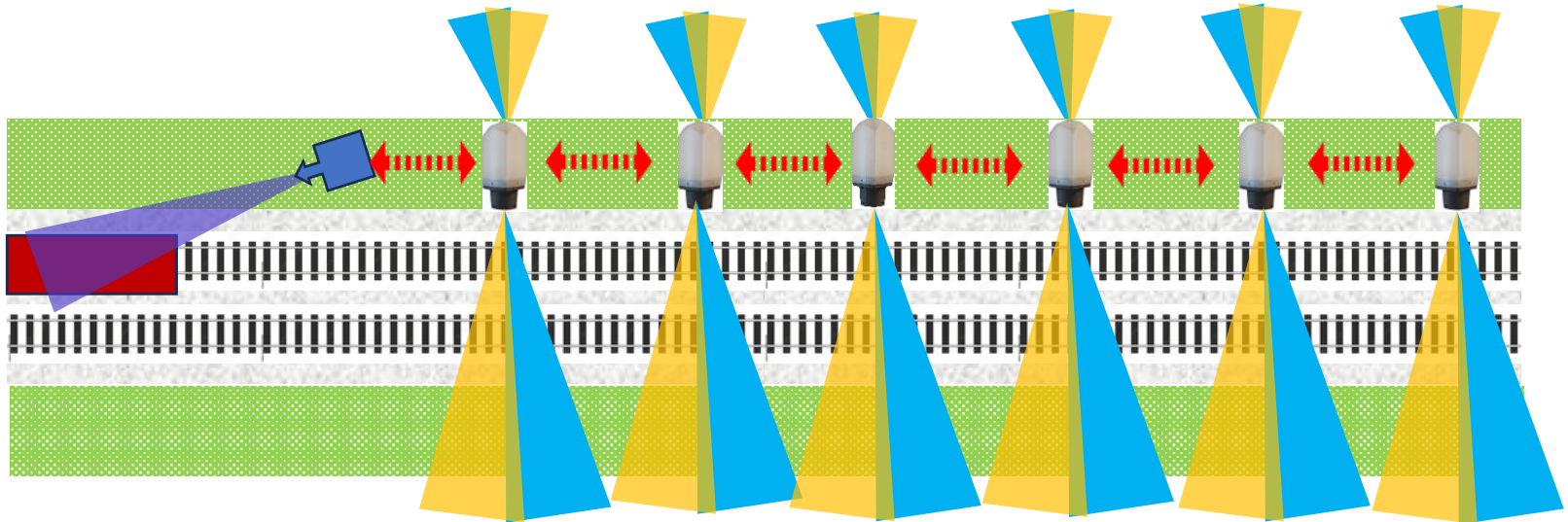


How does the Virtual Rail-Fence works?

As soon as a train approaches, the remote trigger is detecting the train.

He then sends a wireless trigger signal to the first DD461, which wirelessly activates all further devices in the group.

This creates a **Virtual Rail-Fence** that prevents game from crossing the tracks.













Remote monitoring of DD461 Virtual Rail-Fence installations

The status of the DD461 installations can be monitored remotely via the wireless network and the DD601 Internet gateway.

Various information such as battery charge, ambient temperature and brightness, activation cycles and the position of the alarms can be queried.

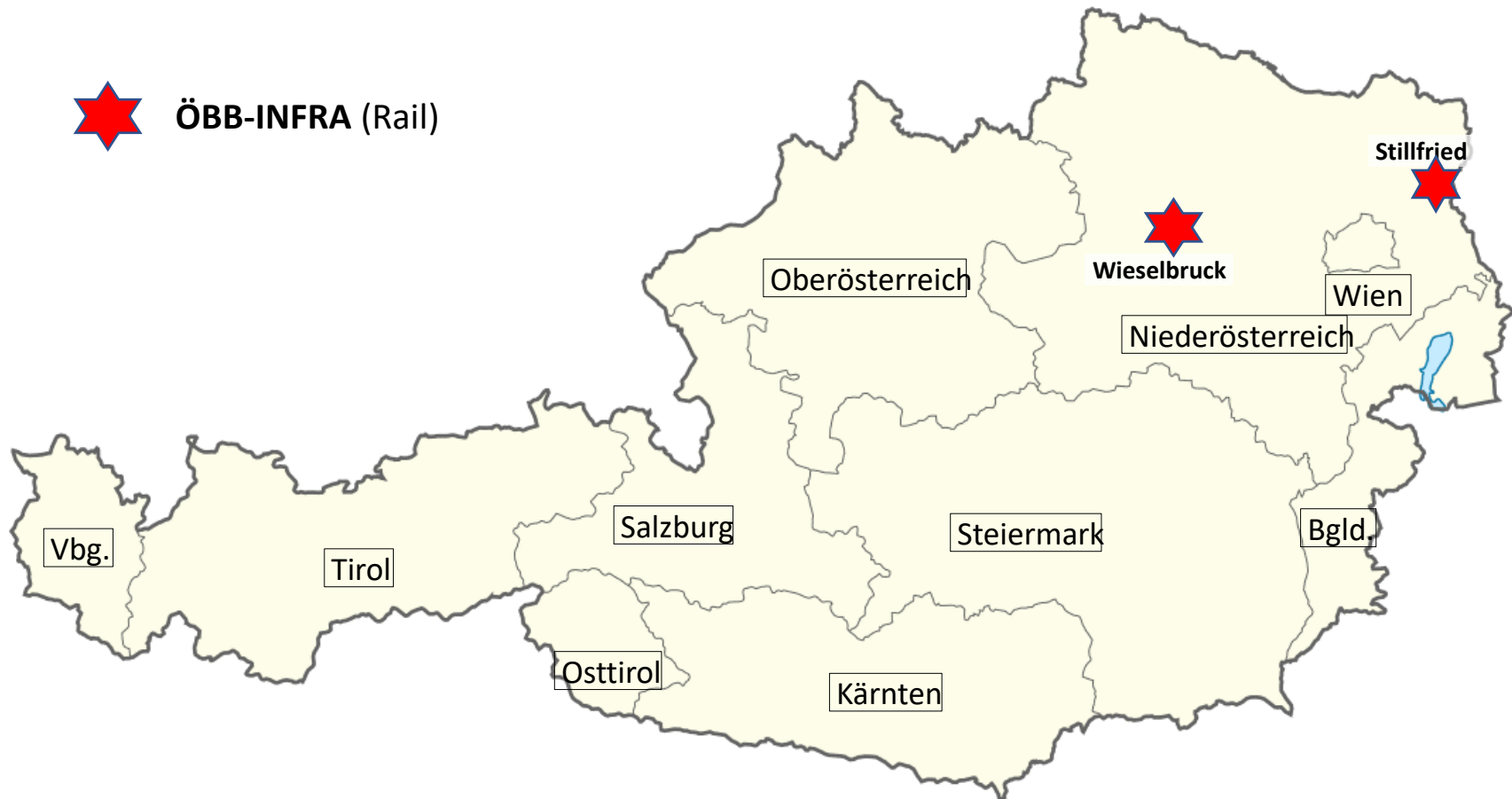


Active Devices Overview						
Net-Address	Gateway	Site	Voltage	Temperature	Ambient Light	Connectivity
10:00:11:01	20:00:10:06	Zlatten	4133	33	7308	
10:00:11:02	20:00:10:06	Zlatten	4128	34	7317	
10:00:11:03	20:00:10:06	Zlatten	4118	33	7326	
10:00:11:04	20:00:10:06	Zlatten	4139	38	5778	
10:00:11:05	20:00:10:06	Zlatten	4139	37	6786	
10:00:11:06	20:00:10:06	Zlatten	4128	34	6984	
10:00:11:07	20:00:10:06	Zlatten	4118	33	5571	
10:00:11:08	20:00:10:06	Zlatten	4071	32	7029	
10:00:11:09	20:00:10:06	Zlatten	4110	33	4617	
10:00:11:0A	20:00:10:06	Zlatten	4133	32	6327	



DD460 Virtual Rail-Fence:

Railroad Testsites Wieselbruck - Stillfried



DD460 Virtual Rail-Fence:

Railroad Testsites Wieselbruck - Stillfried



Wieselbruck: Travelling speed up to 230 km/h



Stillfried: Track equipped with DD460. Distance 25m

The Parndorf - Zurndorf Rail Testsite



ÖBB-INFRA (Rail)



The Parndorf - Zurndorf Rail Testsite

The Parndorf-Zurndorf railway line runs through a beautiful area, but also one with a high number of wildlife accidents. Inspections along the route have shown that, due to the special ecological situation, more than 100 different wild animals - deer, hares and birds of prey - die in train collisions every year on this 5 km section alone.

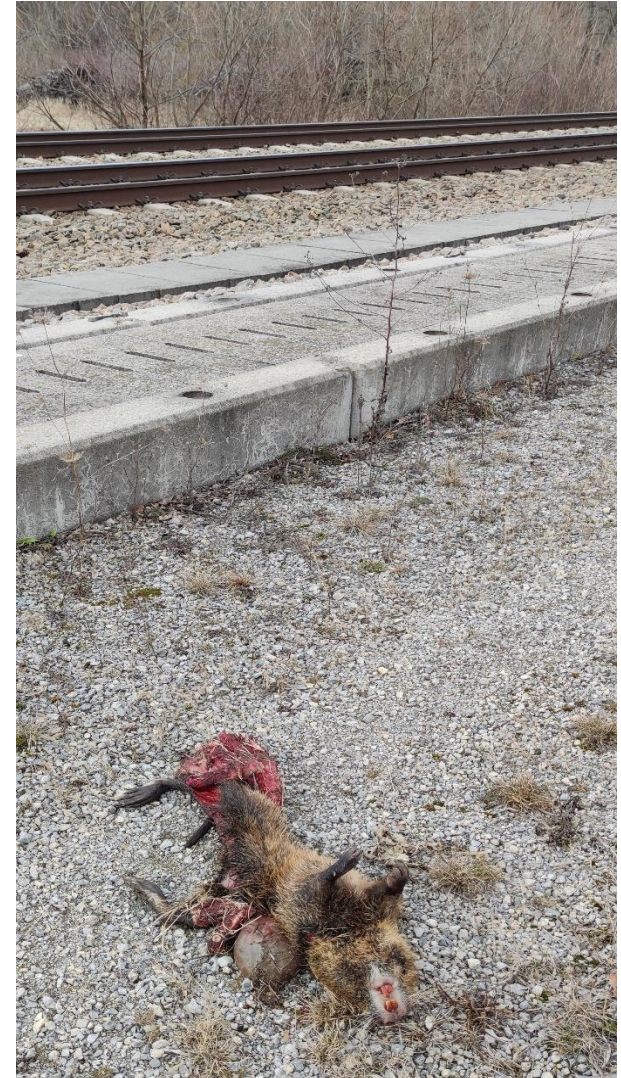


The Parndorf - Zurndorf Rail Testsite Results

Physical inspection of the test site in March 2021 shortly before installation of the DD460:
23 remains of dead animals were counted on the first 1.2 km on the left side of the railway track alone:
5 deer, 9 brown hares, 2-3 foxes, 4 birds of prey and some undetermined species.

Result of the inspection in March 2022 after the DD460 installation:

5 remains were still found on the same part of the track:
1 roe deer, 3 brown hares and 1 bird of prey.
This still results in a remarkable **reduction** in fallen game by **78 %!**



Thank you for your kind attention!



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