

Wildlife overpass as secondary habitats for the Common Wall Lizard (*Podarcis muralis*)

Suggestions for future proper design



CHRISTIAN NEUMANN
christian.neumann120@gmx.de
Öko-Log - Field Research
Joachimsthaler Strasse 9
16247 Parlow - Germany



The Wildlife Overpass

The wildlife overpass across the autobahn A1/A48 at the motorway junction at Wittlich, Rhineland-Palatinate, Germany, was built as a CEF-measure for the expected habitat fragmentation and destruction due to the construction of the Bundesstrasse B50neu. The measures should not only mitigate the negative effects on umbrella species like the wild cat, but also on other species on the biocenosis. As an example we investigated the suitability for wall lizards.

So the population of common wall lizards (*Podarcis muralis*) located on the wildlife crossing was investigated in the framework of an efficiency monitoring in the year 2011.

Specifications of the Wildlife overpass

constructed: 2005-2008
opened: April 24, 2008
Construction costs: 1,9 Mill. €
Width: ~35 m

Since Sommer 2009 continuous monitoring of the wildlife overpass with an installed video surveillance system and regular technical improvement by Securiton GmbH and analysis of the videorecordings by Öko-Log.

Other animals which were also detected on the wildlife-crossing are: European Wildcat, Red Deer, Common Dormouse, Bechsteins's Bat, Greater Mouse-eared Bat and Sandlizard



Method

The monitoring on the wildlife crossing was carried out with visual observation, use of artificial hideouts and by mark-recapture method.

Every captured wall lizard was photographically recorded. The individual squamation of the thorax was used for individual identification. Also every captured lizard was marked with a 3-digit color-code on their backs and the tail ends for later identification.



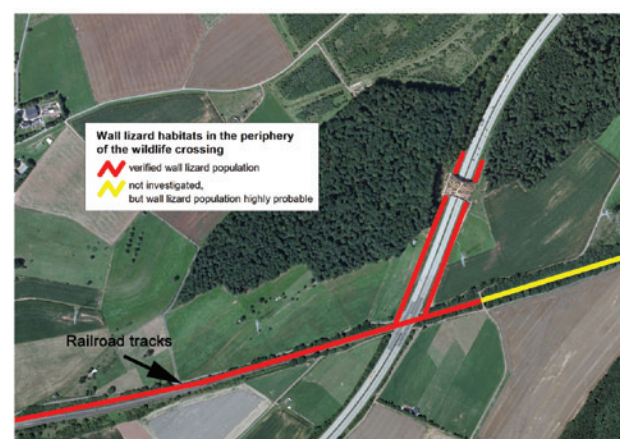
Population

Calculation by:
LINCOLN-Index: 159
SCHNABEL-Method: 92
JOLLY-SEBER: 90
Sex ratio ♂:♀ 1:1,5

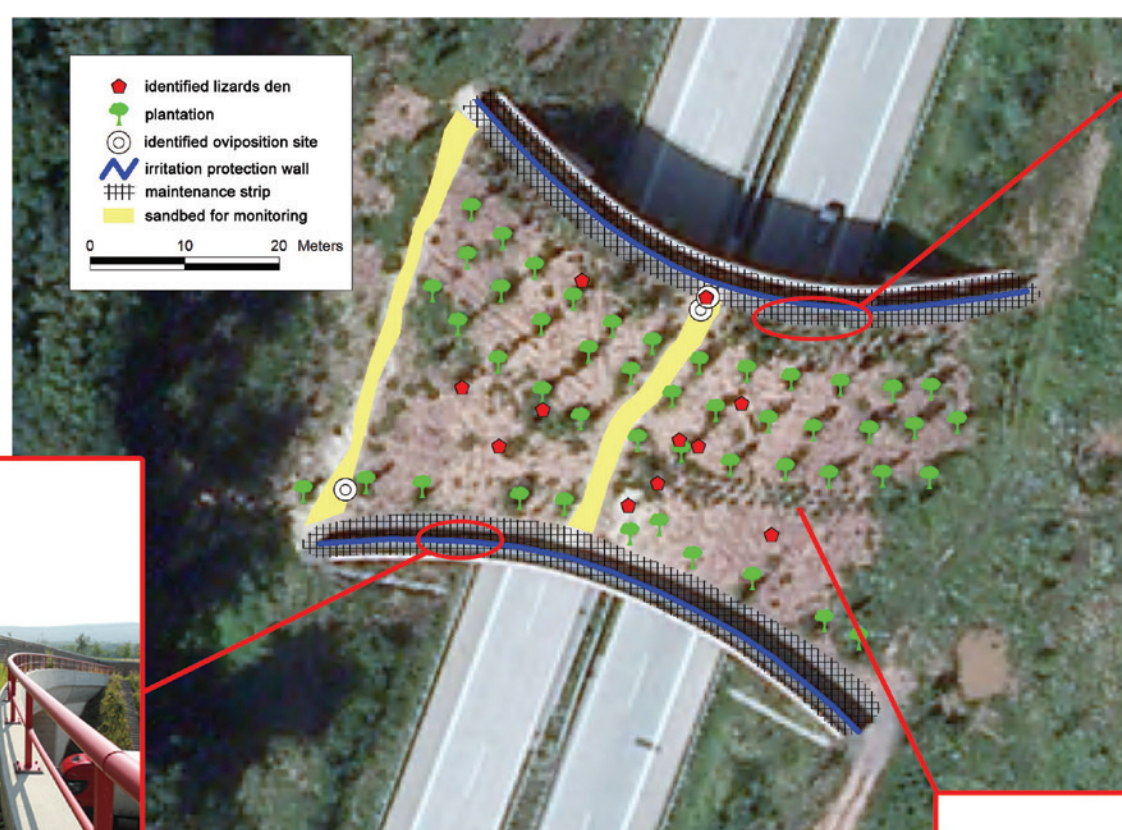


Home of a source population

The strictly protected common wall lizard is the most dominant reptile species at the Wittlich motorway junction. Wall lizards can be found at nearly every investigated slope of the motorway junction. Also the nearby railroad tracks are populated by wall lizards. But those are mostly linear habitats with low population densities in contrast to the open area of the wildlife crossing with its high population density. The wildlife crossing is primary home of a local source population, but it also connects the habitats on both sides of the motorway.



What factors made this wildlife crossing a great secondary habitat for the Common Wall Lizard (*Podarcis muralis*)?



Animal passages

Animal passages at the base of the irritation protection walls allow a fast and stressless passage to the other side of the wall. The passages are used to access habitat on both sides of the wall and are also excellent for escaping from predators.



Maintenance strip

On each side of both irritation protection walls a gravelstrip was built primarily for maintenance work but also for xerophile animals. This gravelstrip was regularly used by the wall lizards as basking spot. It was the second most frequented basking site on the wildlife crossing (right after the irritation protection walls). The gravel is about 1 m deep, so it also offers potential hiding-places and hibernation sites.



Basking sites

Basking sites are nearly everywhere on the wildlife crossing. Used are places with spare vegetation, especially the gravel strip. The most frequented basking site was the south exposed side of the northern wall. This is due the exposition (most sunshine over a day) and the construction of the walls: The overhanging wooden planks on the sides exposed to the motorway are more difficult to climb for the wall lizards.

Oviposition sites

The sand bed used for monitoring game is used by the wall lizards as oviposition site. Most hatchlings were found in late summer near the sand bed.



Protection wall against irritation

The wooden protection walls against provide a proper vertical habitat for the wall lizards. The walls are used as basking spots and offer protection from predation. The wall lizards can also use the walls as hunting ground and prey upon invertebrates which are found there (e.g. spiders, moths, beetles). The territory of a dominant male wall lizard extends over ~3-4 wall elements. The rough surfaces of the wooden walls allows the lizards to climb easily on this vertical structures. The wooden walls have also the advantage that they don't get heated up by the sun as concrete or metal.



Following characteristics made this wildlife crossing a great habitat for Common Wall Lizards and are suggested for similar wildlife constructions:

- The initial planting was reduced to a minimum. The rest was left to succession.
- An uneven ground offers a lot of microstructures with different microclimates.
- Wood as construction material of protection walls against irritation is recommended: It offers wall lizards a perfect vertical habitat with lots of gaps and hiding places. Wooden walls as construction material is sufficient for irritation protection as our analysis of the videorecordings indicates.
- Animal passages at the base of irritation protection walls guarantee a high permeability of the walls.
- Maintenance strip made of gravel is frequently used as basking spot. The depth of about 1 m offers hideouts and potential hibernation sites.
- The sand bed for monitoring game offers oviposition sites for wall lizard.

The investigation proved that with smart design wildlife overpasses are not only suitable for connecting lizard populations but can also offer a habitat for a local source population.