

7.4.5 Adaptation of the habitat alongside the infrastructure

General description

Different ways of designing and managing habitats alongside roads and railway lines are used with the aim of reducing the number of collisions. Some are designed to prevent animals from moving onto the road surface by attracting animals elsewhere, others by influencing the behaviour of animals or by making animals more visible.

Cutting of vegetation

The cutting of bushes and trees within a 3-10 m strip alongside the road reduces the attractiveness for large mammals such as moose. At the same time the visibility of the animals to drivers is improved. The measure is designed to reduce the number of collisions between large mammals and cars. This measure is suitable for roads with low traffic load and for railway lines.

Verges with short vegetation often have high densities of small mammals (rodents) and are therefore attractive to birds of prey. This may increase the risk of collisions with birds.



Figure 7.89 - Cutting high vegetation alongside the roads makes large mammals, *e.g.* moose like in this example from the E18, Akershus in Norway more visible to drivers, and removal of vegetation which is an attractive food-source will reduce the risk of having animals foraging along the road. (Photo by B. Iuell)

Choice of plant species

The choice of the right plant species to be planted alongside roads can reduce the number of collisions between cars or trains and animals. While it is advised to use native plant species, care should be taken to avoid

plants which may attract animals to the road verges for foraging, increasing the risk of collisions with cars:

- Bushes and trees, which are not attractive to browsing deer, etc.
- No bushes with attractive berries, in particular not in the central reservation. Berry bushes attract songbirds, mainly during migration.
- Forest fires often start from roads. Plant species that burn easily should not be planted to reduce the risk of fires spreading to adjacent habitats.

Hedges

- Hedges along fences can lead animals towards fauna passages. A gap between the fence and the hedge facilitates maintenance work along the fences.
- Bushes alongside the fence reduce the danger that large mammals try to jump the fence.
- Tall tree hedges force birds to fly high. Thus they cross the road at a height where they don't collide with cars. On the other hand, hedges may attract birds to the vicinity of the road increasing the risk of collisions.
- The planting of hedges has to consider the above-mentioned points of visibility and choice of food plants.

7.4.6 Adaptation of infrastructure

Noise barriers

Noise barriers are constructed close to human settlements to reduce noise emissions, although in certain situations they are erected to protect, for example, colonies of breeding birds from disturbance. However, even if not constructed for wildlife they have to be treated in this chapter because they can increase habitat fragmentation even more than fences. In densely built-up areas noise barriers do not usually provide any problems in this respect. In more natural surroundings they are complete barriers for all terrestrial animals.

Non-transparent screens

Noise barriers built of concrete, wood or other material are complete barriers for animals. In natural environments they must therefore be combined with fauna passages. This has to be considered also in cases of low noise screens along railway lines, which may hinder the movement of small vertebrates like snakes, which without barriers would not have been greatly affected by the railway line.

In combination with passages noise screens can function as guiding structures.

Noise screens are usually built on a solid concrete base. They thus completely isolate the road verges from the surrounding habitats. For small animals, especially invertebrates, they are therefore a more complete barrier than fences. No experience exists as to the effects on the animal populations or regarding possible solutions to reduce the barrier effects, such as small openings at the base of the structures.



Figure 7.90 - This noise barrier has openings at the bottom to reduce the barrier effect for small animals. (Photo by H. Bekker)

Transparent screens

Transparent screens are erected in areas where planners wish the drivers or passengers to be able to see the surrounding landscape. They entail a high risk of mostly fatal collisions for birds, which don't recognise the wall as an obstacle, in particular where natural vegetation can be seen through the glass or where the glass reflects bushes or trees. It has been shown that with appropriate markings the number of collisions can be reduced substantially.



Figure 7.91 - Transparent noise barrier along a motorway in Switzerland with vertical markings. (Photo by H. Schmid)

Design

- Vertical markings are recommended, although other types may also be effective.
- Marking strips should be 2 cm wide with a distance between the strips of a maximum of 10 cm (or 1 cm wide, distance 5 cm).
- Light colours are preferable to dark ones, because they are more visible in the twilight.
- Markings should be applied on the outer side of the wall (*i.e.* away from road) to avoid reflection.
- Silhouettes of birds of prey are not recommended. They are only effective to prevent collisions if put up at a very high density.
- No reflective material or glass should be used.



Figure 7.92 - A few isolated silhouettes of birds of prey are ineffective to prevent collision by birds. (Photo by C. Rosell)



Figure 7.93 - The planting of bushes close to transparent screens should be avoided. (Photo by V. Hlaváč)

Points for special attention

- Wherever possible, transparent screens should not be built. Non-transparent walls can be covered with bushes or climbing plants.
- No trees or bushes should be planted in the vicinity of transparent noise barriers because this increases the risk of collisions. Where trees or bushes are planted as mitigation measures, no transparent noise barriers should be built.

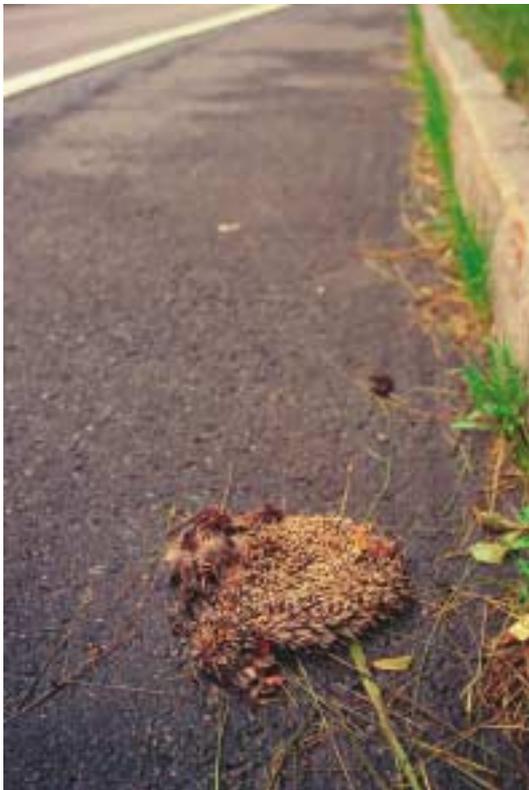


Figure 7.94 - Hedgehog trapped by a kerbstone. (Photo by B. Iuell)

Adaptation of the kerb

Vertical kerbstones are often too high for small amphibians, reptiles, mammals or invertebrates. If they don't find an exit, animals get trapped and usually die. Gently sloping kerbs are a cheap alternative. With a height above the road of a few millimetres at the bottom they are still detectable, *e.g.* by blind people using a guiding stick. A gap between vertical kerbstones can provide escape possibilities as well, especially if plants are allowed to grow between the stones.

Escape ramps from drains

The gaps in metal covers of drains are often too big for small vertebrates and for invertebrates, which fall in and drown. Ramps offer the possibility of escape. In areas with spawning runs of amphibians a wire mesh placed under the cover of the drain prevents animals from falling in. Amphibians are the only animals to survive the way from drains to clarification plants and therefore need purpose-built escape ramps at the plant to get out.

Notes:

- The ramps should have a rough surface to provide a good grip.
- The end of a ramp should be about 15 cm higher than the surrounding terrain.
- The end of a ramp should be fitted with wire netting to prevent small predators from climbing onto the ramp. The mesh size should be about the same size as the gap in the metal cover.

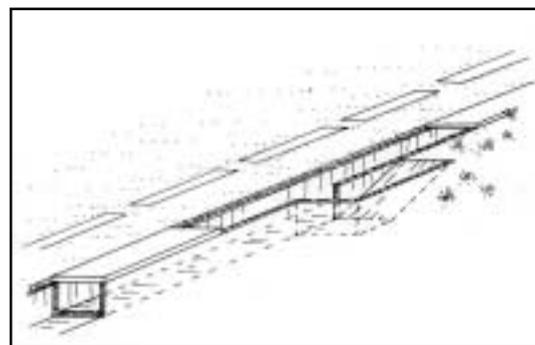


Figure 7.95 - Escape ramps from drains each 25 m help to avoid the deadly trapping of small animals.

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Cover photo: Fauna overpass Woeste Hoeve over highway A50 between Arnhem and Apeldoorn in the Netherlands. It provides an ecological connection for all kind of habitats. (Photo by Luchtfotografie Slagboom en Peeters)