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Wild animals on railway tracks - why do accidents happen?

Abstract: Railway lines are a permanent element of wildlife habitats and usually do not have a large impact on animals functioning in their natural environment. Sometimes, however, when an animal finds itself on the tracks while a train passes, they pose a deadly danger. The article presents the causes of wild animal – train collisions resulting from how the senses and psyche of animals function and how they perceive railway lines.

Keywords: Railway lines; Environmental impact; Wildlife; Wild animal – train collisions

Introduction:

Most railway lines were established so long ago that, from the perspective of animals, they have existed "forever." They are linear structures cutting through fields and forests, and in addition to the tracks and ballast of the railway line, there are drainage ditches, embankment or cut slopes, often overgrown with low vegetation, and periodically mowed strips of land. In practice, the width of the entire railway line encompasses several or more meters of exposed space - a place perfectly suitable both as a feeding area and as a convenient hiking trail.

Railway lines have a relatively minor impact on the surrounding natural environment; however, they serve as barriers to the movement of small creatures (amphibians, rodents) and are the cause of the death of a certain number of animals. Paradoxically, technological advancements, while increasing passenger safety, have also increased the mortality of animals on the tracks. One reason for this situation is the higher speed of trains, and the second is the increasingly effective soundproofing of the railway line and the safeguards against ground vibrations, causing animals to notice fast and quiet approaching trains much later.

Animal on the Tracks

Poland can still boast a high level of biodiversity. We have numerous protected areas. We have animal species that have nearly become extinct in Western Europe. Common species, such as the roe deer, wild boar, and fox, are widespread across almost the entire country and often even appear in cities. In the case of linear investments, it is impossible to avoid all ecologically valuable areas, let alone all habitats of common animals. Railway tracks often cross their territories, resulting in animals crossing them as part of their normal, daily activities. Migratory species also have fixed routes along which they travel long distances - these are so-called ecological corridors with significance ranging from regional to pan-European. Some animal species use them cyclically at specific times of the year (for example, during the mating season when males seek females, or when young ones look for new territories after separating from their mothers). Representatives of other species gladly migrate through them year-round (for example, moose). From an ecological standpoint, maintaining the permeability of ecological corridors and enabling animals to freely migrate, colonize new areas, and exchange genes between populations is extremely important. Crossings of migration routes with roads and railway lines are places where accidents involving representatives of ecologically valuable animal species are particularly likely.

Animals also cross the tracks in forced situations - when they are being chased by a predator (or are the predator chasing prey) or when they are startled by humans. In the face of life-threatening danger, all that matters is to escape in time. A chased animal runs almost

blindly, thus having a greater chance of being hit by a train because it pays less attention to its surroundings. The train seems to pose an insignificant threat compared to the predator at its back. No devices intended to prevent their mortality will work on a panicked escaping animal - the stimuli they emit are by far less significant than a living predator. Such situations have been recorded by monitoring cameras placed near the tracks - selected frames of the film are shown in Fig. 1 - 5.



1 – 3. A deer chased by dogs runs across the tracks just in front of the approaching train (images from the camera monitoring the E20 railway line) source: SGGW

The problem of animals living in herds and sticking together (such as roe deer, deer, and wild boar) is also noteworthy. Wherever the herd leader goes, all its members follow. Sometimes the leader crosses the road or railway line when the approaching vehicle is not yet visible, but by the time the last animal is crossing, the vehicle is already close. An individual animal tries by all means to avoid being separated from the rest of the herd and prefers to take the risk of running just in front of the approaching train rather than remain on the other side of the tracks.



4 – 5. Deer and wild boars crossing the E65 railway line (images from the camera monitoring the E65 railway line) source: SGGW

Usually, the trackbed itself is an unfriendly place for animals, but there are situations where it attracts them. In winter, when a thick blanket of snow covers everything, cleared tracks become the most convenient walking path. In spring, during food shortages, slopes covered with low vegetation provide valuable grazing areas. Omnivorous animals (such as

foxes, wild boars, and eagles) may also penetrate the tracks in search of remnants of struck animals.

Perception of Trains by Animals

A constant influx of stimuli from the environment affects all the senses. Most of these are just background information. We do not pay attention to constant, unchanging elements of the surroundings, nor do we assign much importance to the general informational noise—and animals behave similarly. If a smell or sound is not associated with anything desirable or threatening, the animal seems not to notice it. A lack of reaction does not necessarily mean that the animal does not see or hear something—it may simply be ignoring it as insignificant. To understand animal behavior, it is important to remember that although their senses are often much more sensitive than humans', animals focus on perceiving specific types of stimuli. Shy roe deer or deer are particularly sensitive to signs that may indicate the presence of predators: they pay close attention to any movement in their surroundings, look around when they hear alarm calls from birds, and avoid areas with the scent of wolves. On the other hand, to avoid wasting energy on unnecessary escapes, they quickly learn to ignore what proves to be non-threatening—even if it is the deafening roar of a mechanical saw or a train passing by at a distance of 20 meters.

As mentioned earlier, animals primarily react to signals that may herald their natural enemy. But how do they know which sounds and smells to recognize as such signals? Essentially, this knowledge is encoded in their genes and is therefore instinctive. Animals born in captivity also react to certain signals, even if they have never encountered them before. These signals are known as **key stimuli**. There are also learned reactions to specific stimuli—if a mother shows her young that something is dangerous, the young will also fear it. And if an animal learns that the noise of a mechanical saw does not pose any danger, it will not flee from that sound. Signals originating from human-made sources, in this case from a passing train, do not belong to key stimuli. The noise and sight of a train can be unpleasant or disturbing due to their intensity. However, when observing a train from a safe distance on the embankment, its "behavior" does not indicate an intention to attack. If an animal does not learn that the train is dangerous, it will not fear it. Unfortunately, such learning often ends with the death of the struck animal.

A significant phenomenon is the so-called **flight initiation distance**, which is the critical distance of an approaching object beyond which the animal flees. This distance depends both on the animal itself and on the type of threat. A dangerous predator provokes flight from a distance, while a less threatening one can approach much closer. When faced with a threat outside the repertoire encoded in their genes, the flight initiation distance is very small—only when the train is almost upon them does the animal flee. Moreover, trains move faster than known predators, so the decision to flee is often made by animals too late.

Species that have almost no natural enemies, such as bison, may not react at all to objects like cars or trains and may respond to an "attack" with a counterattack. Nature has equipped them with massive bodies, strength, and horns. In their natural environment, other animals move out of the way of bison, so representatives of this species see no reason to yield to an approaching vehicle. Based on the arguments presented, it can be concluded that trains do not resemble threats that animals would instinctively react to in any way. A train does not smell, sound, look, or move like a predator. Passengers can often observe various animals through the train windows, including herds of shy roe deer grazing right by the tracks. They have become accustomed to the sight of trains, the noise, and the vibrations, so they do not even react with slight concern. They convince themselves that a passing train is not a threat to them - until the moment they find themselves on the tracks just before it.