

The problem of the massacre of amphibians in Poland based on the example of road no. 780 Kraków-Libiąż in the village of Poręba-Żegoty

Józef Curzydło

Agricultural University of Krakow, al. Mickiewicza 24/28, 30-059 Kraków

Abstract. The work shows an example of drastic decrease in the size of amphibian population in the town of Poręba-Żegota, situated by the busy 780 road Cracow-Oświęcim. It is a result of the area draining and, until recently, massacre of the animals, mostly in the section of the road running along post-manor ponds and an old park. In this region grey toads and grass frogs used to occur in large numbers. A rescue action, initiated in 1999, starts to give positive results. It originally involved setting up road signs “Beware of amphibians” and subsequently, the construction of plastic fences of 300 m length, guiding animals to the special baskets. Three times a day frogs were transferred to the containers and carried to the other side of the road. Moreover, the article directs attention to the conditions which special passages for amphibians should meet in the Polish climate.

Key words: roads, fauna mortality, mitigation measures, amphibians passages

1. Introduction

Amphibians (*Amphibia*) are a group of heterothermic terrestrial-aquatic vertebrates. Among the many species of amphibians, still commonly found in Poland are the common toad, common frog, pool frog, moor frog, and common newt. Our society can still enjoy the melodious concerts so romantically described by Adam Mickiewicz in ‘*Pan Tadeusz*’.

Unfortunately, there are less and less amphibians every year; they have disappeared from, among other places, the suburbs of Krakow (Borek Fałęcki and Wola Justowska). Let me just mention that as late as in the spring of 2006, I heard a frog concert in the Bieszczady Mountains, where there also are many storks, which is evidence of the unpolluted environment there.

Amphibians are beginning to disappear from other regions of Poland too, and it is high time to rescue them. I presented my position in the 1999 in *Aura* no. 7-8/99 (Curzydło 1999a) and in a paper at the International Seminar (Curzydło 1999b). Unfortunately, amphibians are still being massacred by dynamically developing road transport.

2. Massacre of amphibians in the village Poręba-Żegoty

The presented results of my observations were gathered in the years 1998-2006. By the densely-trafficked road no. 780 Kraków-Oświęcim in the village of Poręba Żegoty, there is a region with post-manor ponds and an old park, as well as arable fields and meadows. In the surrounding area, there are, or rather used to be, great numbers of amphibians, in particular common toads and common frogs, which migrate from the park and the fields to the nearby ponds on the other side of the

road every year in the early spring during the mating season; they were massacred by cars on the road.

In the year 1999, thanks to the efforts of environmentalists and the Town Office of Alwernia, an “Uwaga na płazy” [‘Amphibians – slow down’] road sign was erected (Fig. 1).

In early spring 1999, as was the case in previous years, thousands of amphibians died under the wheels of cars during the mating season (Figs. 2 and 3).

In the year 2000, a considerable number of amphibians were rescued at the end of March (Ropuchy w siatce, 2000). Thanks to the financial support of the Department of Environmental Protection of the Małopolskie Voivodship Office in Kraków (director – Jerzy Wertz), and to the efforts of the Alwernia Town Office (Marta Siemek) and the involvement of the Environmental Protection Society (Jarosław Snopek), the situation for amphibians in Poręba-Żegoty, as well as in other regions of southern Poland, improved noticeably.

Mr. Aleksander Ziemia from Poręby-Żegoty built, from materials (foil) supplied by the Department of Environmental Protection of the Małopolska Voivodeship Office in Kraków, a fence approx. 300 meters in length and buried a few buckets. As a result of these actions, amphibians are forced to walk along this provisional fence, searching for a passage to get to the other side of the road to the ponds. Frogs, moving along the foil fence, fall into the buckets buried at ground level. From there, several times a day (usually in the early morning, at noon, and in the evening), Mrs. Krystyna Ziemia transfers them to another bucket (Fig. 4), in which she transports them to the other side of the road and dumps them out at the edge (Fig. 5), from where they can safely walk to the nearby ponds.

The author came across special culverts for amphibians in 1997 in Switzerland. Along Lake Neufchatel on the section of road between Yverdon and Yvonand, the road runs through an area rich in amphibians and aquatic birds. Each spring, this road was “crossed” by frogs heading to the lake. At that time, 90% of the amphibians were killed by cars. During the migration of amphibians, the road used to be closed, but this was troublesome. Therefore, in cooperation with biologists and road engineers, 14 culverts for amphibians were built along 1.5 km on migration routes in 1984, with special concrete open channels guiding the amphibians to the culverts, as presented in photos (Figs. 6 and 7). Through such culverts, the frogs have no problem, directed by their instinct, with no obstacles, reaching the nearby lake, laying spawn and returning through reversely built culverts to their permanent home.

Due to the fact that in Poland, winter conditions are more severe and the ground freezes deeper than in Switzerland, culverts built at the level of the road surface are more advantageous (Fig. 8), because then during migrations the surface of the road is not cooled and because of the heat produced by cars, culverts under the roads can be placed slightly deeper (20-30 cm) (Pfister 1995; Infra 2000).

Of course, these types of culverts (pipes) need to be cleaned after the migration in summer and before migration of amphibians begins in the early spring.

I would like to point out that for several years now, frogs have been carried across the road in Kraków-Wola Justowska. Amphibians from Lasek Wolski (Wolski Forest) and from fields head to nearby ponds in Mydlniki every spring. In order to get to the ponds, amphibians must cross the very crowded Kasztanowa and Królowej Jadwigi streets, where they are massacred in the spring. For several years, amphibians have been carried across the roads in buckets by the scientific assistant of our Department, Artur Szymacha. A similar situation with carrying frogs takes place in Rytra and in Ojcowski Park.



Fig. 1. Drivers do not pay much attention to road signs like this one



Fig. 2. Toads massacred by vehicles on road 780



Fig. 3. Sides of the road covered with dead frogs

This commendable way of transporting amphibians proves temporarily effective in the early spring, when amphibians start their mass mating migration on a few warm and usually rainy days, but the problem with protecting amphibians starts upon their return, which is not concentrated and is extended in time. At that time, the animals are massacred again.

The special passages for amphibians and reptiles, however, work “both ways,” so that the returning amphibians safely reach their permanent home. I hope that in our region, such passages for amphibians will finally be built, which, in contrast with green bridges built over highways for large mammals, are not expensive.



Fig. 4. Transferring the frogs from buried buckets (in the ground just by the foil fence) to buckets in which the amphibians are carried across the road and ‘dumped’ at the edge of the pond (Fig. 5), from where they safely walk to the water in order to lay spawn



Fig. 5. ‘Dumping’ the frogs at the edge of the pond



Fig. 6. In early spring each year, frogs are guided by their breeding instinct from forests and arable land and head to the other side of the road to lay spawn in Neu Lake

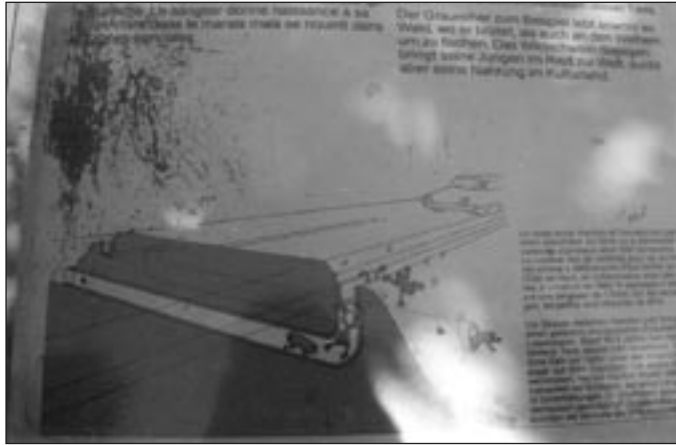


Fig. 7. Diagram of a two-sided safe tunnel for amphibians under a busy road



Fig. 8. Culvert on one of the roads in Belgium, built even with the road surface

3. Conclusions

The village of Poręba-Żegoty is classic evidence that there were two reasons for the dramatic reduction of the population of amphibians in this region: *(i)* no working two-ways or guiding culverts, which should be built at the same level as road surface or slightly lower; *(ii)* drying up of part of ponds in front of Podworski Park. Amphibians have no place to deposit their spawn, and the scarcity of offspring along with their massacre on the road gradually eliminate them from the environment.

Concrete culverts for amphibians, built deeper under the road surface (Fig. 7) have the effect that in the early spring, when amphibians in the mating season start their migration, can have a too-low bodily temperature during their passage under the road and stop, waiting until they warm up. Therefore, culverts built more recently are located at the same level as the road or in a small indentation.

Special culverts for amphibians need to be constructed in the regions where their habitats are, which means wherever there are water reservoirs (ponds, lakes) located across a road from the place of their permanent inhabitation.

When building culverts for amphibians, as in the case of green bridges for large mammals, the example and the rich experience of Western European countries should be utilised.

References

- Curzydło J. (1999a). Przepusty dla płazów, gadów i małych ssaków. *Aura*, 7-8: 25-26.
- Curzydło J. (1999b). Problem ekologicznych mostów i przepustów dla zwierząt wolno żyjących w Polsce. Materiały Międzynarodowego Seminarium pt. „Ekologiczne przejścia dla zwierząt wolno żyjących i przydrożne pasowe zadrzewienia – niezbędnymi składnikami nowoczesnych inwestycji transportowych (autostrady i linie kolejowe)”. Kraków, 7-10.09.1999; 169-180.
- Infra Eco Network Europe. Fragmentation, Defragmentation. Belgium, (2000). Materiały edukacyjne, Konferencja IENE, Bruksela.
- Pfister H. P. (1995). Faune, construction routes et trafic. Societe Suisse de Biologie de la Faune Copyright, SBF 1995.
- Ropuchy w siatce, (2000). *Dziennik Polski*, 77, 31. 03. 2000 r.