SHORT NOTE

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Newt mortalities on an urban cycle path

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ABSTRACT - There are many anthropogenic obstacles faced by amphibians in the urban environment. An example of one of these is roads between habitat features such as hibernation sites and breeding ponds; this leads to traffic mortalities. In urban settings, cycle paths may be as busy as roads and present similar dangers; we report this in the case of smooth newts (*Lissotriton vulgaris*) attempting to cross a cycle path in central Cambridge. We also explore a potential solution, a drift fence, which we wish to implement in the future to prevent further declines.

INTRODUCTION

Roads are a common obstacle encountered by amphibians as they move to their breeding ponds in the spring (Mazerolle, 2004). Amphibians may also be at risk on the return migration to their hibernation sites or when they are foraging terrestrially (Meek, 2012). Amphibian metamorphs may also be at risk when they disperse from their ponds. During this initial migration it is well documented that road traffic may cause high mortality rates in common toads (*Bufo bufo*; Cooke, 1995). Unfortunately this is a widespread problem that is not just limited to the United Kingdom; many amphibian species are at risk of being killed by cars as roads get busier and as they cut through potential habitats (Glista et al., 2008).

The road traffic associated with amphibian mortality includes bicycles although they are less well documented than mortalities from motorised vehicles. The combination of noise and vibration gives the amphibians a warning that cars may be present, but due to the speed at which cars are travelling amphibians often do not have time to escape the path of oncoming traffic. Work in the USA has shown that car-associated stimuli such as bright headlights tended to lead to amphibians remaining immobile, perhaps because it disrupts their visual system (Mazerolle et al., 2005). Bicycles pose a threat as they do not make as much noise as cars and create fewer vibrations than motorised vehicles, when travelling over paved surfaces. We present evidence perhaps for the first time that urban cycle paths can be a source of mortality for newts.

MATERIALS AND METHODS

On 21 February 2014 after a period of mild and wet weather, the authors followed up reports from members of the public, via the Cambridgeshire and Peterborough Amphibian and Reptile Group (CPARG) of dead newts along a busy cycle path in central Cambridge. On arrival at the area at 1:30 pm on the Chesterton side of Riverside Bridge (TL 4640 5954), we discovered 12 dead smooth newts (*Lissotriton vulgaris*) that had been killed by bicycles. Of these, 9 were males and 3 were female. We continued to monitor the site over the next 13 weeks (between 27 February and 20 May 2014) and made nine more site visits during times when the weather was favourable for amphibian surveys (a night time temperature above 5˚C, preferably with rainfall). The cycle path was monitored by torchlight when we visited the breeding pond, which is roughly 10 m away. We visited at night as this is when we suspected the newts were active and so aimed to prevent any further mortality. We made an effort to go on the same evening every week, but were limited by the weather. Night-time was also when the cycle path was least busy and so safer for us to examine any newt carcasses. The breeding pond was surveyed using standard protocols for night-time amphibian surveys (Griffiths et al., 1996) and surveying of the pond only commenced after we were made aware that newts were present in the area.

RESULTS & DISCUSSION

During the time that both the cycle path and pond were monitored, only five more newts were found to have been killed by bicycles (Fig .1). In total we observed 17 smooth newts that had been squashed by bicycles, most of which were male. The newts were spread over an area of roughly 5 m^2 and all but one facing in the direction of the breeding pond. Typically we visited the site when the air temperature was between 7-11˚C but on our last survey the air temperature was 16.4˚C. Our peak count for smooth newts within the breeding pond during 2014 was 36 newts, a mortality event like the one observed may pose a threat to a small and isolated population of amphibians. On the first visit to the site it was clear that not all of the newts had been killed at the same time, due to varied levels of decomposition. Some individuals had been killed earlier than others, and those that had been struck earlier appeared to be crushed into the pavement. This may have been due to continual running over from cyclists, foot traffic, or due to the decomposition process. Weather conditions and the traffic intensity will influence the rate at which amphibians are likely to be struck (Mazerolle, 2004; Meek, 2012).

The newt habitat is divided by the narrow cycle path

Figure 1. A squashed smooth newt (*L. vulgaris*) on the cycle path.

Figure 2. A view of the site from Riverside Bridge, the breeding pond is 10 m to the right and the hibernation site can be seen on the left. The adjoining footpath can also be seen on the left hand side.

with the aquatic breeding habitat and ideal terrestrial habitat on either side. The presumed hibernation site consists of a mound of earth covered in brambles and shrubbery. It is only when the newts try to cross from one side to the other during the spring and summer migration that they are at risk of being struck by a bicycle. Newts may be more vulnerable to such threats than anurans due to the fact that they are much slower moving (Gibbs & Shriver, 2005). In addition, their elongated bodies means that they are more likely to be struck when crossing roads and cycle paths as their lower profile makes them harder to see than a toad or frog. Newts are also less active than frogs or toads and so may spend more time on the road/path increasing the risk of them being squashed.

This negative impact was not observed in the population during 2015 or 2016, despite the risk still being present. There may have been no newt mortalities as the conditions may have been different to those in 2014. The bridge was built between the years of 2007-2008 and so is a relatively new. Observed foot traffic on the bridge is usually quite low in comparison to the cycle traffic. All of the dead newts were observed at a junction at the foot of the bridge (Fig. 2), where a footpath joins the main route. At this point cyclists may not be paying as much attention to the ground ahead of them, as they may be more focused on trying to avoid pedestrians especially around such a tight corner. It is likely that the 12 individuals we first discovered were killed during the initial migration between the presumed hibernation site and the breeding pond. The reason why we failed to find as many newts again over further site visits may be because the majority of smooth newts had completed their migration.

With a view to assessing the impact of cycle paths on amphibians in Cambridge and locations around the country it may be prudent to work towards identifying potentially problematic sites. To help minimise the risk of bicycle related mortality, site specific solutions need to be implemented. In the future we aim to question cyclists in the area to find out if they are aware of the presence of newts and whether or not they care about the risk facing them on the cycle path. Raising awareness of the newts presence may help reduce future impacts of cyclists in the area. A more permanent solution to the problem at Chesterton would be to put drift fencing along the cycle path to prevent the newts crossing, redirecting them to a safer crossing location. This alternate crossing is only 2 m away leading the newts under Riverside Bridge directly to their breeding pond. Drift fencing was not implemented in either 2015 or 2016 due to a lack of time, funds and permission. We will be hoping to implement this solution in time for the 2017 migration. An alternative solution would have been to create a tunnel connecting the hibernation site to the breeding pond. However, this would be impractical as the foundations of the bridge are too deep.

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