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#### **Author**

Dolan, Lisa

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## MONITORING OF WILDLIFE CROSSING STRUCTURES ON IRISH NATIONAL ROAD SCHEMES

Lisa Dolan (Phone: 00 353 87 95783, Email: [l.dolan@student.ucc.ie](mailto:l.dolan@student.ucc.ie)), Department of Zoology, Ecology and Plant Science, University College, Cork, Ireland

### Abstract

Ireland is currently undergoing the largest extension to the National road network in recent years. For this reason, the number of crossing structures for wildlife on the Irish National road network has increased markedly within the last few years.

In Ireland, the structures are targeted at protected species whose habitat is directly disturbed by road construction. In general, the target species are otters (*Lutra lutra*) and badgers (*Meles meles*). However, structures have been put in place for red squirrels (*Sciurus vulgaris*); i.e., rope ladders linking trees on opposite sides of a motorway and the first structures for pine martens (*Martes martes*) and bats will be put in place in the coming year. Bat boxes and bird boxes have also been fitted on the tunnel ceilings of oversized arched culverts with mammal ledges.

Underpasses and overpasses (potential green bridges) have been constructed where farms have been bisected by new road schemes. These structures allow for the safe passage of domestic cattle over the road carriageway, but may also be utilized by wildlife, for example, red deer (*Cervus elaphus*) and other smaller wildlife species.

Non-target native species which can utilise these structures are: red deer (*Cervus elaphus*), the indigenous Irish hare (*Lepus timidus hibernicus*), stoat (*Mustela erminea hibernica*), fox (*Vulpes vulpes*), pygmy shrew (*Sorex minutus*) and field or wood mouse (*Apodemus sylvaticus*).

Non-native species which could potentially utilize such structures include: Sika deer (*Cervus nippon*), fallow deer (*Cervus dama*), brown hare (*Lepus europaeus*), rabbit (*Oryctolagus cuniculus*), grey squirrel (*Sciurus carolinensis*), hedgehog (*Erinaceus europaeus*), brown rat (*Rattus norvegicus*), house mouse (*Mus (musculus) domesticus*), bank vole (*Clethrionomys Glareolus*), feral ferret (*Mustela furo*), American mink (*Mustela vison*), and domestic cats and dogs, amongst other introduced species.

This is the first study to examine the effectiveness of crossing structures in Ireland. An initial pilot study monitoring the use of crossing structures on the Watergrasshill By-Pass, County Cork, Ireland, revealed encouraging results as the following species were found to utilize oversized arched culverts with mammal ledges: otter, fox, rabbit, pygmy shrew and wood mouse. Tracking tools utilized include: ink pads, sand beds, and infrared cameras.

The initial pilot study was expanded to monitor crossing structures on a national scale in order to examine: (A) how effective are the culverts at providing passage for the target species? and (B) to what extent are cow under- and overpasses being utilised by wildlife?

More specifically, the study is also currently examining: (1) with what frequency are the various passages being utilized?; (2) what non-target species utilize these passages?; (3) does the design of the fauna pipe (dimensions) affect utilization of the passage? e.g., are shorter pipes or longer pipes or small diameter (600 mm) or large diameter pipes (900 mm) more frequently used?; (4) does the presence of hedgerow planting enhance use of passage structures? (5) what kind of pipes do smaller species have a preference for?

It is intended that the results of the study will provide valuable information which could improve the layout, design, and maintenance of future crossing structures to be put in place on national road schemes in Ireland, and indeed, in other countries.