Effectiveness of fauna passageways at main roads in The Netherlands

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Abstract

Many different types of fauna passageways have been constructed in The Netherlands, and many more will be constructed within the next twenty years. In the past decade the Road and Hydraulic Engineering Division of the Dutch Ministry of Transport, Public Works and Water Management commissioned several investigations to assess the use and effectiveness of these fauna passageways. Next to gathering knowledge about animal species who use these mitigation measures and who don't, the aim of the research was to discover the most important factors affecting the use and effectiveness of fauna passageways. The results are used to improve lay-out, design and maintenance of both existing and planned passageways.

Recent studies have given a fairly good picture of the use of badger tunnels (fauna pipes) by badgers. However, a question that remained was which other animal species use these passageways and what factors affect this use. To answer this question, some 50 fauna pipes were investigated during two periods: 8 weeks in the autumn of 2001, and 8 weeks in the spring of 2002. Track boards with inking pad and paper sheets, specially developed for this study, were inserted into the fauna passageways. In addition as a control a track board was placed in the proximity of each tunnel. All 50 fauna pipes were used by animals during the research period. The pipes were used by a total of 14 target species: hedgehog, red fox, badger, beech marten, polecat, stoat, weasel, brown rat, wood mouse, red squirrel, hare, rabbit, toad (species unknown) and frog (species unknown). Non-target species that used the pipes were cat and raccoon. The use of these pipes by salamanders has not been proved, although tracks of salamanders were recorded on some of the control sheets located in the immediate vicinity of each pipe. Most species, with the exception of mice and amphibians, seem to use the fauna pipes deliberately. Most species use the pipes to the same degree in spring and autumn. However, only badgers used the pipes considerably more often in spring, whereas brown rats used the pipes considerably more often in autumn.

Pipe use by badgers did not have a significant negative effect on the use of the same pipe by other animal species. This suggests that some use by badgers does not exclude the use by other species. However, when a pipe was used by cats a significant negative effect on the use by other mammals (e.g. mice) was found. Mustelids and amphibians used pipes with a length of 40 metres or less more frequently than longer pipes.

With the investigation of fauna passageway use, the question remains unanswered about the effectiveness of these passageways to guarantee population viability. In order to find an answer to this question, a monitoring project was started for three species: red deer, badger, and crested newt. For red deer ecoducts [wildlife overpasses] are supposed to facilitate genetic exchange between populations intersected by roads. Badger pipes and walking strips in culverts or beneath bridges are supposed to increase population viability of badgers and crested newts respectively.

In the first stage of the project potential study areas were determined where the effectiveness of fauna passageways at the level of populations can be assessed. The next step will be to design and conduct a monitoring programme to answer the question whether defragmentation efforts are sufficient to ensure population viability of the wildlife species addressed.

Research and Monitoring the effectiveness of Trans Canada Highway Mitigation Measures in Banff National Park, Alberta,

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Abstract:

In the last 50 years, the Trans-Canada Highway (TCH) has transformed into a major commercial highway and become Canada's economic lifeline, connecting goods and people from the Atlantic coast to the Pacific. The TCH runs through Banff National Park (BNP), Alberta, and during this time the national park also has become a major tourist destination, attracting more than 5 million visitors per year, thus creating heavier traffic demands on an already bustling highway. Banff and neighbouring Yoho National Park are the only national parks in North America that have a major four-lane transportation corridor bisecting them. In 1998, the TCH in Banff carried on average more than 14,600 vehicles per day year-round, peaking at more than 30,000 vehicles per day during summer. Consequently, this major highway can have a significant impact on the mountain park ecosystem. Hence, reducing road-related mortalities and potential barrier effects of the highway on animal movement makes good ecological sense and is an obvious necessity.

In November 1996 we began a 5-year investigation in BNP. Our primary study area was situated in the Bow River Valley along the TCH corridor in BNP, located approximately 100 km west of Calgary. The first 45 km of the TCH from the eastern park boundary (phase 1, 2, and 3A) is four lanes and bordered on both sides by a 2.4 m high wildlife-exclusion fence. The remaining 30 km to the western park boundary (phase 3B) is two lanes and unfenced. Plans are to upgrade phase 3B to four lanes with mitigation within the next 5 to 10 years. Twenty-two wildlife underpasses and two wildlife overpasses were constructed between 1980 and 1998 to permit wildlife movement across the four-lane section of TCH. Our secondary or extensive study area extends along the TCH from the Kananaskis River (Highway 40) west of Calgary, to the western boundary of Yoho National Park. Other highways in the study area include Highway 40 in Kananaskis Country, Highway 93 in Banff and Kootenay National Parks.

Wildlife-vehicle collisions have been a problem in the mountain national parks and a cause for concern among park managers and transportation planners for many years. The long term trend and prospects are for increasing traffic volumes on the TCH and other primary roads in the parks. Development of practical highway mitigation will rely on an understanding of patterns and processes that result from highway accidents, which involve elk Cervus elaphus and other wildlife. We analysed the patterns of elk mortality on roads and characteristics of all wildlife-vehicle collisions. We assessed how effective fencing and wildlife crossing structures were at reducing wildlife road-kills and buried vs. unburied fencing was at preventing animal intrusion onto the right-of-way.