

tussen Duin & Dijk



Connection and defragmentation

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Foxes

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on the Zandpoort ecoduct



● Ecoduct Zandpoort. Photo: Antje Ehrenburg.

In December 2013, construction of the Zandpoort wildlife overpass or ecoduct was completed, intended to establish an ecological connection between the Amsterdam Water Supply Dunes and the Zuid-Kennemerland National Park. Several species have been using this ecoduct since. This particular article will focus on one strikingly frequent visitor: the fox.

Situation

The Zandpoort ecoduct runs from the Amsterdam Water Supply Dunes (AWD) at the Stokmansberg to the Koningshof in the Zuid-Kennemerland National Park (NPZK) and passes over the busy Zandvoortse-laan. It is the result of a collaboration between NPZK, Natuurmonumenten, Puur Water en Natuur (PWN), Waternet, the Province of Noord-Holland and the Municipality of Zandvoort. It is the first in a series of three ecoducts to be constructed within the Natura 2000 site Zuid-Kennemerland. A second ecoduct passing over the Zeeweg

has been completed since, in 2017. Once the three overpasses have been completed (which should be before the end of 2018), 7,000 ha of dune will be interconnected. To the best

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of our knowledge, these are the first wildlife overpasses in the world to be built to establish links between dune nature reserves. In order to be able to assess animals' use of the bridge, a monitoring plan has been designed for the period 2014-2018.

The bridge was built to support species that thrive in dune grasslands rich in flowers. The monitoring programme mentions 22 so-called guide species. The underlying assumption is that if these species make use of the bridge, other species of that habitat type should be able to as well. Certain species such as the Roman snail (*Helix pomatia*) and the slowworm (*Anguis fragilis*) are only expected to appear in the longer term. The vegetation on the bridge should develop into calcareous dune grassland.

For further background information on this ecoduct and the monitoring thereof, we refer to Van der Spek *et al.* (2017). Wingelaar (2017) reported on foxes' (*Vulpes vulpes*) usage of the ecoduct in her research project for the secondary school ►



● Fox in the Amsterdam Water Supply Dunes. Photo: Miranda Zutt-van der Made.

final exam (the so-called ‘profielwerkstuk’), and this article presents some interesting findings from her research.

Research methods

Two camera traps have been installed to record the larger mammals, including foxes (Van der Spek *et al.*, 2017). For the 2014-2016 period, all observations of mammals for each year have been entered in a spreadsheet specifying the species, date, time, direction and specific details where relevant. Some gems that were recorded include a fox with a rabbit (*Oryctolagus cuniculus*) in its mouth and a fox with cubs. The results have been summarised in annual reports (Noort & Achterkamp, 2015-2017). All fox-related data has been used to create this article. In the first year, due to camera problems, only seven months (March-September) could be monitored. In total, 313 passing foxes were analysed. Whenever multiple foxes crossed the bridge at the same time, they were recorded as two foxes.

Results

Foxes already found their way to the ecoduct straight after its

completion. Right on the very first day the cameras became operational (21 March 2014) a fox was seen crossing the ecoduct. Over the research period as a whole, foxes respectively crossed the ecoduct 59 times (2014, within 7 months), 105 times (2015) and 148 times (2016) per year. The number of foxes crossing the ecoduct increased each year. It is striking is that many more foxes have been observed crossing the ecoduct from the Zuid-Kennemerland National Park (NPZK) towards the Amsterdam Water Supply Dunes (AWD) (going south) than the other way around (going north). This applies not only to the total



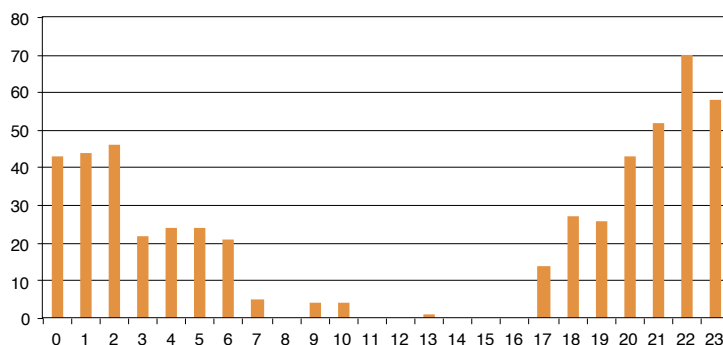
● Fox at Ecoduct Zandpoort. Photo: from camera trap.

number, but also for each individual year. The ratio is about 35 percent (going north) to 65 percent (going south). Do the AWD perhaps have something special to offer?

Foxes are mainly crepuscular and nocturnal animals (Lange *et al.*, 1994; Twisk *et al.*, 2010 and others), and the photographs taken clearly reflect this. Between 07:00 and 17:00, there is hardly any activity. The (late) evening is a favourite time for crossing: in absolute numbers, the most foxes were spotted between 21:00 and 00:00 (figure 1). Foxes seem to use the ecoduct more often in the winter half than in the summer half of the year (figure 2). Mid-winter sees the most fox crossings in absolute numbers, while the ecoduct is hardly frequented in May and July.

Discussion

The number of passing foxes is no indication of the number of individuals. We only know that foxes regularly make use of the ecoduct. The fact that more foxes have been seen going towards the AWD than towards the NPZK is difficult to ex-



● Figure 1. Times of foxes' use of Natuurbrug Zandpoort, 2014-2016 (n=528; includes those that are crossing to the other side and visitors to the bridge).



● Ecoduct Zandpoort. Photo: Antje Ehrenburg.

plain. There is no reason to suspect any structural migration or great change in numbers. The cameras may be having more difficulty detecting northward movement coming from the south? Or foxes could be using the ecoduct more often to get to the AWD, and take different routes when going to the NPZK, preferring to go by road perhaps? The fact that daylight is a factor in foxes' usage of the ecoduct may sound self-evident, as we are after all dealing with a largely nocturnal species. In this regard, it is interesting to note that additional evidence of this is provided by the fact that the times of passing in the spring and summer months are earlier in the morning and later in the evening than in autumn and winter. The spike in activity that occurs in winter is also worth noting. Males especially are known to roam in their first autumn and winter, looking for their own territory (Lange *et al.*, 1994). On top of that, the period between December and February is the mating season, also leading to

increased activity. This may have an effect on the number of crossings. The limited amount of activity in spring and summer may have to do with the birth of cubs in this period. Females tend to remain in and later around the den (Lange *et al.* 1994), limiting their action radius.

Conclusion

The ecoduct is clearly meeting a need and it provides foxes with a safe place to cross the road. Foxes make increasing use of the ecoduct. While we have established before that ecoducts have an important role to play in the lives of all kinds of smaller and larger animals (Van der Spek *et al.*, 2017), we can now state that the fox is no exception.

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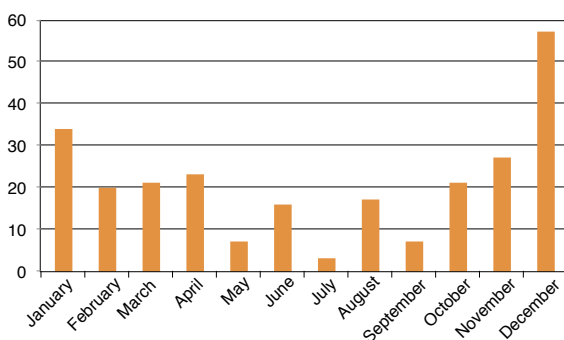
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● Figure 2. Fox crossings per month over the 2015-2016 period (n=253).