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Terrestrial habitat use of the common spadefoot (*Pelobates fuscus*) in an agricultural environment and an old sanddune landscape

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Abstract. The terrestrial habitat use of the common spadefoot was studied in an agricultural area and an old riverdune landscape. In an agricultural area potatofields were the most important terrestrial habitat, in the old sanddune landscape half open sanddunes, sandy pathes between a deciduous wood and a pinewood and sandy pathes in a deciduous wood.

Introduction

In the Netherlands the endangered common spadefoot (*Pelobates fuscus*) can be found in different habitat areas. In two of these areas we studied the terrestrial use during the summer period. One important condition of the terrestrial habitat for the common spadefoot is the availability of a soil to dig in, in which to spend their inactive period. Loss of suitable terrestrial habitat can lead to extinction of populations.

In order to conserve the common spadefoot for the Netherlands, the government developed a protection programme especially for this species. In this programme the LIFE Nature "AMBITION" proposal was written and funded (including four other endangered species) in order to be able to finance measures to improve the biotopes of this species (Bosman et al., 2004).

In general little is known about terrestrial habitat use of the common spadefoot. Eggert

(2002) studied the migration of the common spadefoot in a floodplain. A preliminary investigation was carried out in the Netherlands in a semi natural nature reserve with old sanddunes in 1987 (Bosman et al., 1988). The main aim of this study is to describe the terrestrial habitat types the common spadefoot use in order to be able to improve the management of the terrestrial area of this species.

Material and methods

The study area 'Groot Soerel" is situated on the edge of the valley of the river IJssel in the east of the Netherlands. It is an agricultural area dominated by meadows of pasture land. Other parts are maisefields, small meadowlands, some shrubs and a seed refinement company. Especially for the common spadefoot a nature management organization planted different products on four pieces of land. Two were planted with biological potatoes, one with rye and another with barley. These field crops were new in the area. Within 500 meters from each other there are two reproduction sites in the area (Bosman, 2005).

The "Overasseltse en Hatertse vennen" is a nature reserve along the river Meuse with dunes either covered with spruce or pine trees, oak and birch or (half) open dunes. Beside that there is also some agricultural activity in the area. There are four reproduction sites in this study area (Dijk and Struijk, 2005).

In both areas an investigation route was established to include all the present habitat types in the area. If a road or path was part of the investigation route, it is named after the adjoining habitat types. The route in "Groot Soerel" has a length of approximately 3000 metres, the route in the "Overasseltse en Hatertse vennen" is 1375 metres. In "Groot Soerel" data was collected in 2003 and 2004 (Bosman, 2005). For the Overasseltse en Hatertse vennen" data are used that was collected between 1988 and 1992 (Bosman and van den Munckhof, 1993).

Both studies lasted each year from the beginning of May till the end of September, the period the common spadefoot is in it's summer habitat. As often as possible, but at least once every two weeks, half an hour after sunset the routes were searched for amphibians and especially the common spadefoot. Amphibians were located visually by using a torch and acoustically. For every specimen data was collected, carefully recording the place where it was found and at what time it was found. A detailed description of each location is given. Pictures were taken of the back of the common spadefoot for individual recognition, sex was determined and length was measured.

During every visit more or less the same amount of time was spent in all different habitat types to search for toads in the agricultural area "Groot Soerel". From the total number of common spadefoots found, per habitat type the percentage of spadefoots found was calculated. The area was visited 23 times in 2003 and 2004. For the "Overasseltse en Haterste vennen" the results were corrected for length of the different habitat types as a part of the total length of the route. The number of visits, 82, was equal for all habitat types.

Results

Figure 1 shows the habitat types the common spadefoot used in the agricultural area "Groot Soerel" in 2003 and 2004. Eight specimen of the common spadefoot were found in two habitat types. In potatofields 62.5%

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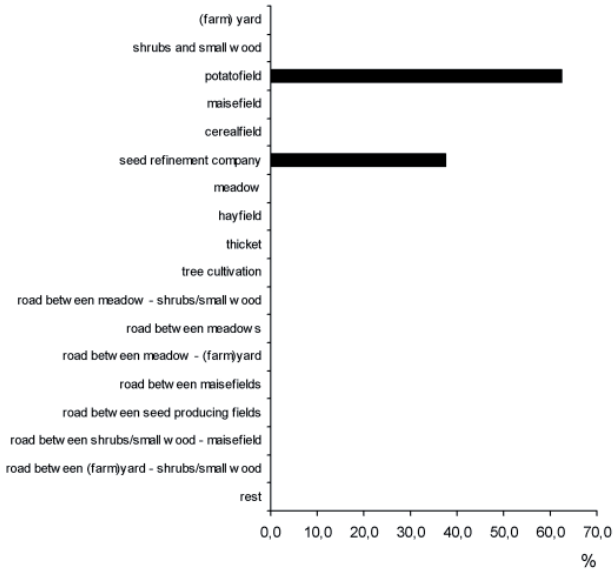

Figure 1. Terrestrial habitat use (%) of the common spadefoot (n = 8) in an agricultural landscape "Groot Soerel", 2003-2004.

of the common spadefoots were found. The other specimen, 38.5 % were found at the property of a seed refinement company.

The results of the old seminatural dune landscape "Overasseltse en Hatertse vennen" in the period 1988 – 1992 are shown in figure 2. Data was collected from 279 specimens. 42,5 % was located on the half open sanddune. On a sandy path between a deciduous wood and a pinewood 20 % of the common spadefoots were found. 13 % of the common spadefoots were found on a sandy path in a deciduous wood. Eight of the habitats scored less then 5 % (Figure 2). No common spadefoots were found on a sandy path between meadows and none were found on a sandy path between meadow and farm(yard) nor on a sandy path between the maise field and (farm) yard.

Discussion

In the agricultural area the common spadefoot used potatofields and the fields of a seed refinement company as terrestrial habitat. Half open sanddunes, sandy pathes in a deciduous wood and between a deciduous wood and a pinewood were most used as terrestrial habitat in the old seminatural dune landscape.

A low number of common spadefoots was found in the agricultural area "Groot Soerel". Unfortunately it is unclear why numbers are low. From another study in the same area we learned that at least 88 specimens

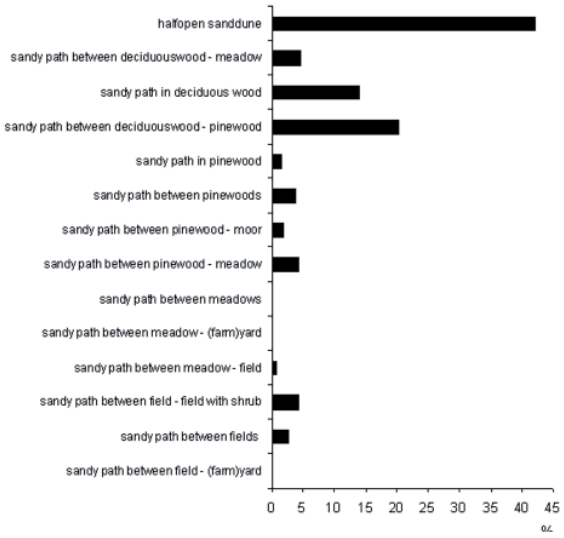

Figure 2. Terrestrial habitat use (%) of the common spadefoot (n = 279) in an old seminatural dune landscape "Overasseltse en Hatertse vennen", 1988-1992.

Figure 3. A half open old riverdune - an important habitat of the common spadefoot.

reproduced at the two spawning sites in 2004 (Bosman, 2005). Including subadults the population normally should be at least twice as big. Visits to this study area were primarily planned on rainy nights with high temperatures but later on also on dry(er) evenings with high temperatures. Unfortunately we were not able to collect more data. On the contrary visits to the nature reserve "Overasseltse & Hatertse vennen" were hardly ever really planned according to the weatherconditions and nearly always common spadefoots were found (Bosman and van den Munckhof, 1993).

Two habitat types in the agricultural area Groot Soerel could not be investigated optimally. (Farm)yards are private property. This means that nearly always people also live there. Apart from a few exceptions most yards, for privacy reasons were not searched for common spadefoots. Another habitat type that could not be searched well, were the cereal fields. The two fields were sowed too densely with cereal. This made it impossible to find any common spadefoots after the cereal grew higher then 40 cm. It also seemed that the vegetation was so dense that there was hardly any space left for a common spadefoot to dig in. For those reasons these habitat types will be underestimated as terrestrial habitat type of the common spadefoot. When suitable conditions exist, common spadefoots can be found in a private gardens (own observations) and also not too densely sowed cereal fields are known to be used by the common spadefoot (Tobias, 2000).

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