Does recreation affect Natura2000 goals for breeding birds? A case study for the Veluwe

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In this paper we consider the relationship between biodiversity, conservation and recreation activity in large nature areas in Europe. Legislation in the European Union aims for better protection of valuable species and habitats by implementing the Habitat and Birds directive. At the same time, health programs stimulate people to go out into these nature areas. Recreational use of nature areas is increasing (Kerbiriou et al. 2009), as is the variety of types of recreation (Naylor et al. 2009). However, there is evidence that stimulating these two functions may be incompatible (Young et al. 2005). Especially for birds, recreation activity was shown to affect population trends e.g. for Chough (Kerbiriou et al. 2009), Golden plover (Yalden & Yalden 1990), Black-tailed Godwit (Holm & Laursen 2009), Woodlark (Mallord et al. 2007) Wheatear (Van Turnhout et al. 2007), Nightjar (Liley & Clarke 2003) and Tawny pipit (Van Turnhout 2005).

In our currently ongoing research, we investigate if recreation might be one of the factors affecting Natura2000 goals in one of the largest Natura2000 sites in The Netherlands, the Veluwe. The Veluwe is almost 1000 km2 large area on sandy soils containing woodlands, heathlands, sand dunes and small streams. The area is popular within The Netherlands for recreation and tourism, and some parts contain high densities of bungalow parks and campsites. The Veluwe is designated as Natura2000 for protecting nature values from both the Habitat and Bird Directive. Considering breeding birds the Veluwe has been designated for Wryneck, Nightjar, Woodlark, Tawny pipit, Stone Chat, Wheatear, Red-backed Shrike, Kingfisher, Honey Buzzard, Black Woodpecker.

The research is being conducted in three parts:
- developing an up-to-date map for recreation pressure;
- analysing the effect of recreation on densities of the breeding birds;
- evaluating whether recreation might effect the Natura2000 goals for breeding birds in the Veluwe.

For the construction of an up-to-date GIS recreation map we included bungalow parks, campsites and car parks as a starting point for visitors of the area. Car parks near sport fields, large companies and high ways were left out. Based on GIS-maps, Google earth and field visits we assessed the capacity of car parks. Visitors from surrounding villages were randomly assigned to the car parks within a distance of 15km, while car parks nearby received a higher preference. The recreation model MASOOR (Jochem et al. 2008) was used to distribute the visitors over the trails.

For analysing the effect of recreation on breeding bird densities we used survey data obtained from 208 plots ranging from a few hectares till several hundreds of hectares. Extra layers of habitat information were used to make a predictive model for the densities in the survey plots. Next, the recreation pressure was added to the model and we analysed if the new model would give a better prediction for the bird densities.

The predictive model will be used to estimate total numbers of breeding pairs in the Veluwe. We will compare these numbers with the Natura2000 goals for the species. These results will be presented at the conference.

In total the car park capacity of 159 cars at The Veluwe was determined. The total trail length at the Veluwe was 7429 km and approximately 200 bungalow parks and campsites were taken into account. Recreation pressure was highly diverse. The southeast part near Arnhem showed the highest pressure (up to 100.000 visitors per year) while some central parts were lowest (Fig. 1).

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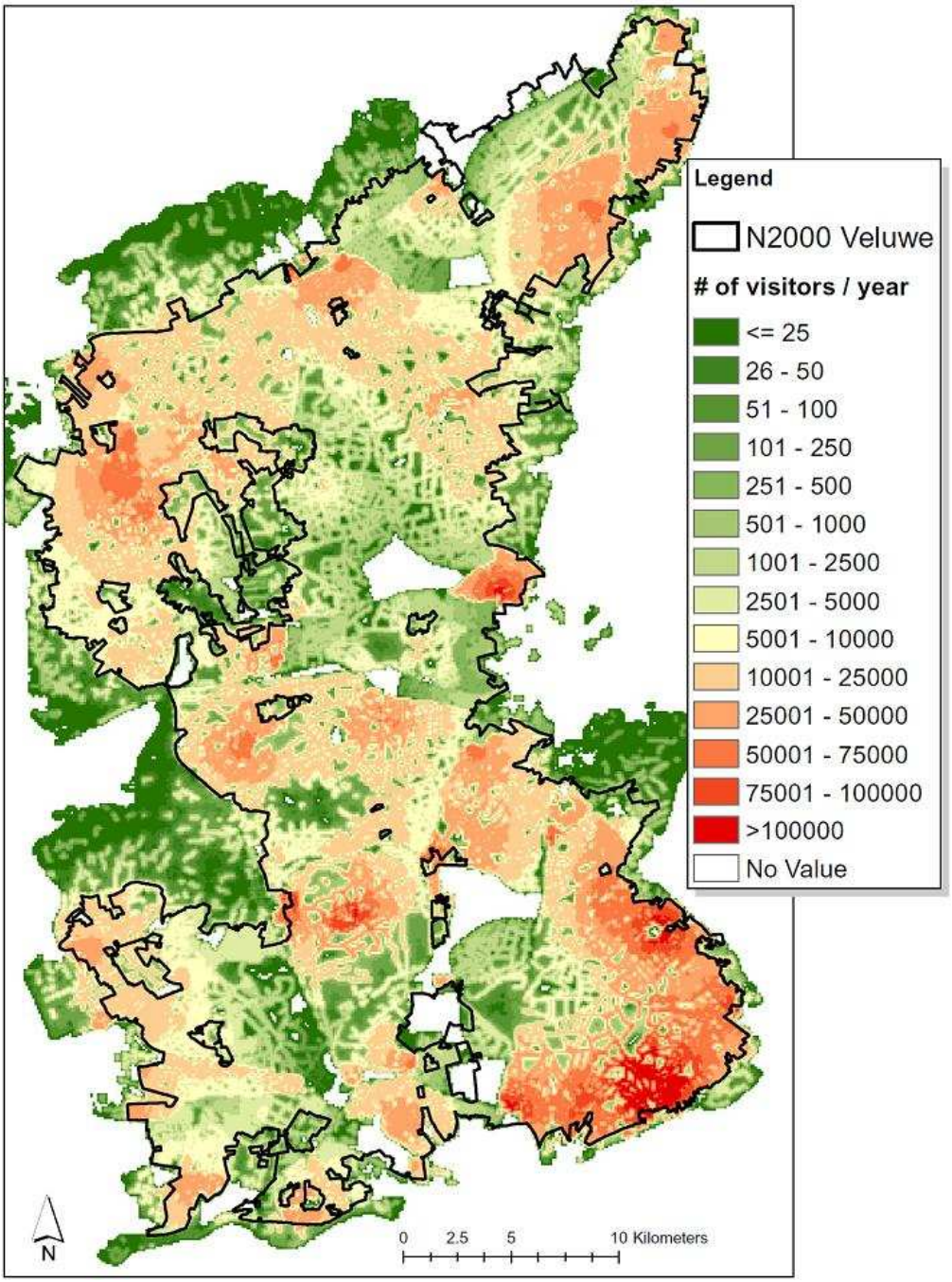

Figure 1: Total recreation pressure.

Data availability for Wryneck, Red-beaked shrike, Tawny pipit and Kingfisher was limited and no useful models could be developed. The models for Black woodpecker and Honey buzzard showed no effect of recreation pressure. Nightjar, Woodlark, Stonechat and Wheatear all showed lower densities by an increase of recreation pressure. This result confirms that heathland species are expected to be more sensitive to recreation then woodland species.

In the dilemma between recreational development and protecting biodiversity, scientists, policy makers, local managers and local communities need to meet each other in order to find a joint and acceptable solution for all (Cash et al. 2003). Scientists can contribute to conflict management by providing objective information (Young et al. 2005). They are expected to help justifying management plans and actions (McCool et al. 2007), but are confronted with a shortage of knowledge (Sutherland 2007) and a lack of sufficient long term monitoring data of both recreation (Cole 2006) and management effects (Wilhere 2002). With the final results of this research we hope to be able to fill in small part of the knowledge gap of the impact of visitors on biodiversity values at the landscape scale.

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