A mammal atlas for the Anthropocene

This issue of Lutra is arriving somewhat late. This year the editorial board decided to issue only one, extra-large, volume. Over the last two years many people in our pool of contributors have invested much of their time and energy in preparing the third Dutch mammal atlas. Half of Lutra's editorial board has also been involved in this endeavour and we are proud to see this project has finally come to fruition.

This issue of Lutra offers a thorough review of the mammal atlas, written in Dutch by Jeroen van der Kooij. This is not the only Dutch language paper in this issue. Last year the editor-in-chief announced a change in our policy, established in 2011, to only accept papers written in English. Since then we have started accepting papers in Dutch again. The paper by Bos et al. in this issue, about the claimed influence of foot-and-mouth-disease on the control of muskrat, was the first recent contribution in Dutch to be accepted.

The already mentioned third Atlas of the Mammals of the Netherlands (Broekhuizen et al. 2016) was published in April this year and covers the period 1989-2012. For the first time, the Atlas includes whales and dolphins, bringing the total number of species included in the book up to 106. In his preface Johan van de Gronden, philosopher and former director of the Dutch branch of the WWF, refers to the national Living Planet Index which shows that the populations of Dutch mammal species have increased by an average of 15% since 1990. The Atlas also shows that, in general, mammals are doing well in the Netherlands: 40 species have a larger range than in earlier atlases, which cover the periods 1946-1969 and 1970-1988, just six species have decreased and nine are more or less stable. For the other species, mainly whales and dolphins, the trend is unknown. There is a marked increase in the population and range of several large or medium-sized species such as harbour seal, grey seal, wolf, red fox, beech marten, pine marten, badger, otter, beaver, roe deer, red deer and wild boar. Several of those species hit an all-time low at some point in the twentieth century, the otter even became extinct in the Netherlands in 1988. While all of these species, except the fox, have been legally protected in the Netherlands since 1942 at the latest, relentless illegal persecution continued into the 1960s. The persecution came more or less to an end after a generation of 'over-enthusiastic' gamekeepers and their allies retired. What we see now is a gradual and steady recovery, due to less persecution and less exposure to persistent and very poisonous organochlorines, especially the post-war generation of pesticides and PCBs. Generally, the lowest level of diversity of mammals in our country as a whole occurred around 1960, which seems to be true for the whole of Europe (Deinet et al. 2013). Rachel Carson's book *Silent Spring* (1962) was a landmark and

a game changer in this respect, although the EU Habitats Directive, climate change and the end of the 'cold war' have all positively influenced the populations of large and medium-sized mammals.

Two years ago the same Johan van de Gronden (2014) wrote an essay entitled 'The Wilderness and Us'. In 2015 he included a translation of the essay into Dutch in his new book '*Wijsgeer in het wild'* (Philosopher in the wild) and added the subtitle '*Natuur in het Antropoceen'* to the title of the essay (van de Gronden 2015). Since the 1980s the term 'Anthropocene' has been proposed to describe a new post-Holocene geological epoch. The term has been widely popularised by the Dutch atmospheric chemist and Nobel Prize laureate Paul J. Crutzen, who agrees that the influence of human behavior on the Earth's atmosphere in recent centuries is so significant as to constitute a new geological epoch for its lithosphere. It may well be that in a few years the Anthropocene will be formally adopted by International Union of Geological Sciences. There are currently several proposals for the designation of the starting year, 1784 as the year of invention of the steam engine is a good candidate. From that point onwards the burning of fossil fuels and the emission of carbon dioxide started to increase rapidly.

The term Anthropocene is an acknowledgement of the tremendous impact that mankind has on the natural environment. In a very densely populated country, such as the Netherlands, this is self-evident. In a sense we 'allow' mammals to also live here. Large and medium-sized mammals can co-exist with man, so long as we 'tolerate' them. They are mobile and intelligent generalists. In the Atlas there is an analysis of the changes (and their causes), threats to, and conservation status of, nearly every mammal. In almost every case changes in habitat, pollution or persecution are contributing to changes in the populations and ranges of mammal species, with eradication and introduction being the two extremes in the spectrum of human involvement in shaping fauna in the Anthropocene.

The new mammal atlas describes some spectacular developments. In March 2015 a young male wolf wandered through the northeast of the Netherlands. Wolf advocates had predicted that the first wolves arriving from Germany would be shy and timid creatures, but this young wolf walked through villages in broad daylight. After several days wandering around in the Provinces of Drenthe and Groningen, the wolf, already known as the 'Wanderwolf' in German, returned back to Germany. A few months later it was run over by a car near Hannover. Another surprising, but much less visible, development was the recent establishment of a small, reproducing, population of wildcats in the woods where the Netherlands, Belgium and Germany meet (Janssen 2015). Wolves and wildcats are part of the historical fauna of the Netherlands and were expected to arrive back with us at some point. The wolf became extinct in the Netherlands in 1869 (cf. Flaton 1989) and the last records of the wildcat are archaeozoological finds from Roman times (cf. Canters et al. 2005). Wild carnivores are steadily recovering from persecution all over Europe. However, in February of this year there was a rather unexpected record of a golden jackal in the Netherlands, just when the new mammal atlas was at its final proof stage. One of the editors asked the publisher if it would be possible to include an addendum about the golden jackal, but the process of printing the Atlas was already too far advanced. So, alas, the golden jackal is not mentioned in the new Dutch mammal atlas.

For decades the yellow-necked mouse was restricted to the same region in the Netherlands where recently the wildcat has established itself. But the new atlas shows that the yellow-necked mouse is invading the Netherlands in several areas all along the Dutch-German border. This is probably due to climate

change which is also having a positive effect on species such as pine marten and wild boar. As late spring frosts are becoming extremely rare, mast of beech and oak is becoming more abundant and reliable. This allows the mice to increase their reproduction success and pine marten to predate more mice.

Not all mammals are doing well in the Netherlands, however. The garden dormouse and the hamster are critically endangered. Decades ago both small species were not uncommon in agricultural landscapes in the far southeast of the Netherlands. In contrast to larger and medium-sized mammals they may have had an all-time population high at around 1960, just before agriculture became heavily intensified. Nowadays, there is only one known population of garden dormouse, living in a woodland near Maastricht, and numbering no more than a few dozen. The hamster only survives in the Netherlands because of special areas that are managed in a hamster-friendly way. These two species cannot survive in the modern agricultural landscape without help. In the hamster reserves predation is the main cause of death and survival is problematic as these areas are too small to cope with massive predation from the surrounding area. Hamster and garden dormouse are two examples of mammals that are not doing well in the current agricultural landscape, not just in the Netherlands, but in most of Europe. Since farmland covers about two thirds of the Netherlands, this should temper any high hopes about the future of mammals in the Netherlands in general. Mammals are recovering in waters, urban areas, woods and nature areas, but in farmland the prospects are still bleak. When the Netherlands held the Presidency of the European Union in the first half of this year, the Dutch Secretary of State for Agriculture, Mr. Martijn van Dam, advocated that the subsidies for agriculture should change from income support to making a more ambitious contribution to the protection and the recovery of natural resources. Unfortunately, this proposal was not endorsed by the majority of the Member States.

Some mammal species that have long been extinct in the Netherlands are making a comeback. However, we are not holding our breath waiting for a return of brown bears. In this issue Kuijpers et al. describe the find of subfossil remains of one of the last brown bears known from the Netherlands that lived in a remote part of the dunes about a thousand years ago.

In another paper, Mulder & Janssen studied the tail defects they found in two Daubenton's bats caught in the same night. The authors discuss the possible origin of these, and other, tail defects, which are rarely reported. Suzuki et al. used nest boxes to study the diurnal rhythm of, supposedly exclusively nocturnal, flying squirrels. Elsewhere, Geelhoed reviews Leopold's (2015) thesis on diets of porpoise: an interesting work, entitled 'Eat and be eaten', which also discusses the recently discovered role of grey seals as a predator of porpoise.

This issue of Lutra contains several contributions that directly relate to earlier Lutra papers. One long standing theme has been a series of articles on stranded whales, which are described in this issue by Keijl et al. in 'Cetaceans stranded in the Netherlands in 2008-2014'. This valuable overview of stranded whales and dolphins on the Dutch coast dates back to 1933, when the topic first appeared in several other magazines on natural history. Since 1955 stranding overviews were published in the direct predecessor of *Lutra* and from 1959 in *Lutra* itself. Another perennial topic to re-emerge in this issue of *Lutra* is off-shore bat sightings. Lagerveld et al. (2012) studied bats in Dutch offshore windfarms during a pilot study, and Boshamer & Bekker (2008) described as incidental observations of bats on oil and gas production platforms. In this issue a long term study, carried out over more than ten years is presented by Hüppop &

Hill on the migration phenology and behaviour of bats at a research platform in the south-eastern North Sea. In the past *Lutra* has also covered reports of stray wolves from the East, the first of which probably originated from the Carpathians and was shot there before being illegally transported to the Netherlands (Gravendeel, de Groot, Kik et al. 2013). In this issue these reports are now described as solid observations by Lelieveld et al. and evidence of a real comeback of wolves in the Netherlands. On a similar theme this issue also has a review by Thissen of a recently issued Dutch book, entitled '*De wolf terug - eng of enerverend?*' (The wolf is back - creepy or exciting?). Finally, in this issue, the rejection of the possible syntype of the rough-toothed dolphin described by Heerebout et al. (2014) is continued by Bekker et al., who traced back the supposedly lost syntype of the rough-toothed dolphin at the Ghent University Museum.

One of our editors is leaving the board. Meike Scheidat has been working with us as a specialist on marine mammals and did a wonderful job as an editor. Unfortunately in her years as a member of the editorial board we received very few manuscripts on marine mammals. We nonetheless thank her very much for her contribution.

References

Boshamer, J.P.C. & J.P. Bekker 2008. Nathusius' pipistrelles (*Pipistrellus nathusii*) and other species of bats on offshore platforms in the Dutch sector of the North Sea. Lutra 51 (1): 17-36.

Canters K.J., J.B.M. Thissen, M.A.J. van Diepenbeek, H.A.H. Jansman & K. Goutbeek 2005. The wildcat (*Felis silvestris*) finally recorded in the Netherlands. Lutra 48 (2): 67-90.

Carson, R. 1962. Silent spring. Houghton Mifflin, Boston, MA, USA.

Deinet, S., C. Ieronymidou, L. McRae, I.J. Burfield, R.P. Foppen, B. Collen & M. Böhm 2013. Wildlife comeback in Europe: The recovery of selected mammal and bird species. Final report to Rewilding Europe by ZSL, BirdLife International and the European Bird Census Council. London, UK.

Flaton, G.T. 1989. Limburgs laatste wolf 1845 of toch 1869? Natuurhistorisch Maandblad 78: 167-168.

Gravendeel, B., A. de Groot & M. Kik, K.K. Beentjes, H. Bergman, R. Caniglia, H. Cremers, E. Fabbri, D. Groenenberg, A. Grone, G. Groot Bruinderink, L. Font, J. Hakhof, V. Harms, H. Jansman, R. Janssen, D. Lammertsma, I. Laros, L. Linnartz, D. van der Marel, J.L. Mulder, S. van der Mije, A.M. Nieman, C. Nowak, E. Randi, M. Rijks, A. Speksnijder & H.B. Vonhof 2013. The first wolf found in the Netherlands in 150 years was the victim of a wildlife crime. Lutra 56 (2): 93-109.

Heerebout, G.R., M.E.J. Bosselaers & J.P. Bekker 2014. On two specimens of rough toothed dolphin (*Steno bredanensis* Lesson, 1828) in a zoological collection in the (southern) Netherlands. Lutra 57 (1): 38-42.

Janssen, C. 2015. De terugkeer van de wilde kat. Roots, November 2015: 24-27.

Lagerveld, S., B.J. Poerink, R. Haselager & H. Verdaat 2014. Bats in Dutch offshore wind farms in autumn 2012. Lutra 57 (2): 61-69.

van de Gronden, J. 2014. The wilderness and us. In: G. Brugmans & J. Strien (eds.). IABR 2014. Urban by Nature: 41-45. International Architecture Biennale Rotterdam, Rotterdam, the Netherlands.

van de Gronden, J. 2015. Wijsgeer in het wild. Essays over mens en natuur. Atheneum-Polak & Van Gennep, Amsterdam, the Netherlands.

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