# The 2006 national Red List of mammals of the Netherlands and a IUCN Regional Red List

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**Abstract:** A proposal for a second Red List of mammals of the Netherlands was published in 2006 by the Society for the Study and Conservation of Mammals. Following Dutch national criteria it covers all 57 mammal species that have regularly reproduced in the Netherlands within a specified period. This 2006 Red List includes 24 species: three Extinct in the Netherlands, one Extinct in the wild in the Netherlands, two Critically Endangered, two Endangered, nine Vulnerable and seven Near Threatened. This article compares this new list with the previous one (from 1994) and adjusts the methods and data used for the earlier one to achieve an appropriate comparison. The reconstructed 1994 Red List comprises 20 species. So, in the past twelve years the Red List has become somewhat longer, although the degree of threat is nowadays less. Generally speaking species found within agricultural landscapes are faring worse, while marine mammals and most bats are doing better. At the same time a separate Red List has been prepared following the internationally used version 3.1 of the IUCN Categories and Criteria. This allows a comparison between the situation in the Netherlands and that in other countries. This IUCN Regional Red List assesses the status of 63 species. Of these, three are Regionally Extinct, one is Regionally Extinct in the Wild, six are Critically Endangered, seven are Endangered, five are Vulnerable and four are Near Threatened. The Data Deficient (DD) category is also part of the IUCN Red List and comprises four species. The IUCN criteria give a more negative picture of the state of Dutch mammal fauna than the Dutch criteria. The most important threats to Dutch mammal fauna come from intensified land use (resulting in the disappearance and deterioration of wetlands and of heterogenous rural landscapes), thoughtless or inadequate management measures in e.g. forests and unproductive parts of the countryside and increasing traffic (resulting in an ever increasing number of road casualties).

*Keywords:* threatened mammals, Red Lists, IUCN Categories and Criteria, regional Red Lists, national Red Lists, the Netherlands.

## Introduction

The Netherlands Ministry of Agriculture, Nature and Food Quality (ANF) commissioned the Society for the Study and Conservation of Mammals to draw up a proposal for a second national Red List of mammals. The society made a provisional list in 2006 which it slightly modified before publishing it in 2007 (Zoogdiervereniging VZZ 2007). This list is known as the 2006 Red List of mammals and will become official when the Minister publishes it in the Government Gazette.

The first Dutch Red List of mammals was officially published in the Government Gazette, the *Staatscourant* 1995 no. 23, and corrected in the *Staatscourant* 2004 no. 218. For this 1994 Red List of mammals a set of official national criteria was used, which differ from the IUCN criteria (although the names of the categories are identical). It is the policy of the Ministry of ANF to revise Red Lists every ten years. Using identical criteria from 2004 onwards the

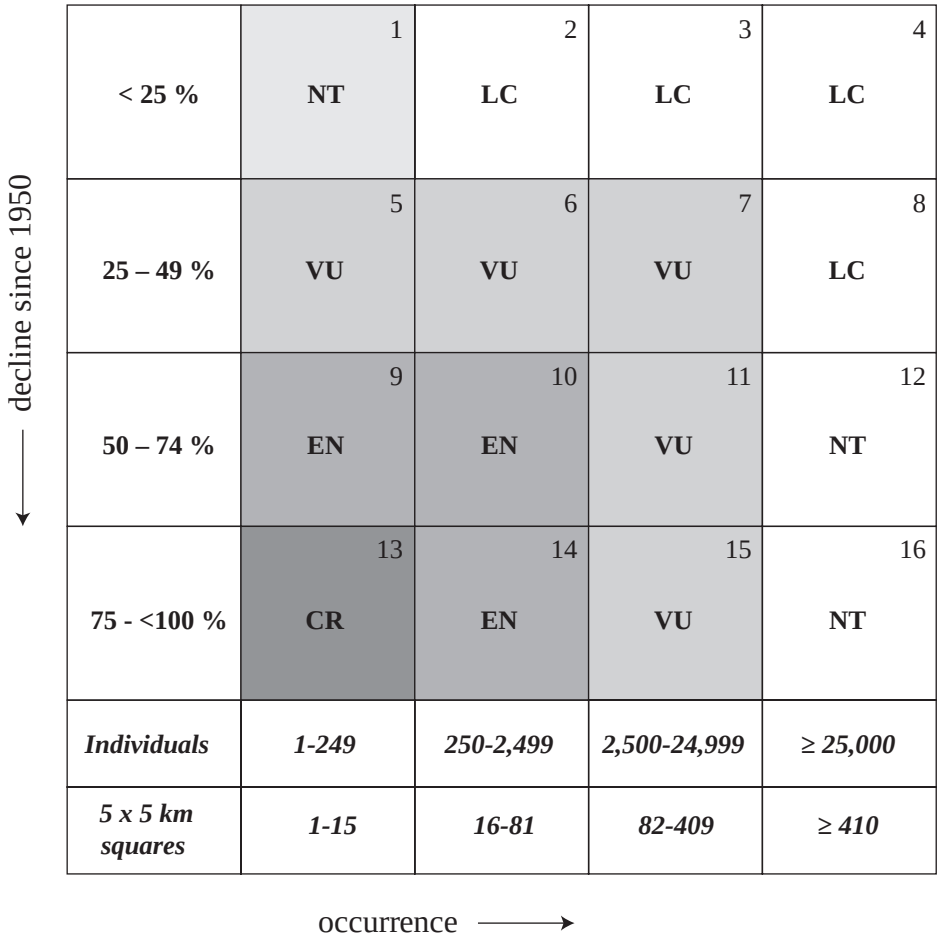


Figure 1. The Dutch Red List categories and criteria (CR: critically endangered, EN: endangered, VU: vulnerable, NT: near threatened, LC: least concern).

Dutch government started a new series of Red Lists for the same taxonomic groups as the first series. The new Red Lists are compared with the old ones and the changes are summarised in a Red List Indicator.

In addition to updating the Red Lists on the basis of the existing national categories and criteria, the Ministry of ANF also decided to initiate a pilot study to test the value of the new IUCN Categories and Criteria in combination with their regional application guidelines. The Ministry requested that two Red Lists of mammals be drawn up, one according to the national criteria and one according to version 3.1 of the IUCN criteria (IUCN 2001) using the IUCN guidelines for application at regional level (IUCN 2003). These guidelines seek to take into account interactions with populations in neighbouring countries. The Red List based on IUCN regional criteria will not be published in the Government Gazette. The list has been finalised and published and its main practical and political use will be for making international comparisons. In this paper we compare this list with the national Dutch Red List.

Taxonomy and scientific names follow Wilson and Reeder (2005). Common names are

On the Dutch Red List of Mammals are many wetland species, such as the root vole (*Microtus oeconomus*). The subspecies *M. oeconomus arenicola* is endemic to the Netherlands. *Photograph: Rob Koelman*.

according to Mitchell-Jones et al. (1999), except montane water vole (*Arvicola scherman*). The geographic scope is the territory of the Netherlands including the Dutch Exclusive Economic Zone in the North Sea.

## Methodology

### Assessed species and used data

The national Red List only contains species that are native to the Netherlands or became naturalised before 1900 and which have reproduced in the Netherlands since 1900 for a period of at least ten consecutive years. Reproduction has been defined as the act of parturition. Fifty-seven mammal species meet these criteria. Under the IUCN regional guidelines species which perform any essential part of their reproduction process in a region should also be included in the assessment, even if they don't actually give birth in the region (IUCN 2003). Accordingly, six additional bat species, which visit the Netherlands at key periods in their reproduction process, have been included in the application of the IUCN criteria, increasing the list total to 63 mammals. These species are Leisler's bat (*Nyctalus leisleri*), Nathusius' pipistrelle (*Pipistrellus nathusii*), Bechstein's bat (*Myotis bechsteinii*), Brandt's bat (*Myotis brandtii*) and the greater horseshoe bat (*Rhinolophus ferrumequinum*) and barbastelle (*Barbastella barbastellus*). The latter two are now extinct in the Netherlands. By way of example, Nathusius' pipistrelle is included on the list as many of them migrate to the Netherlands in late summer and mate here before migrating back to their birthing grounds in Eastern Europe.

Threat categories of species were assessed using distributional data of all species in combination with monitoring data of hibernating bats, monitoring data of daily active mammals and monitoring data of species-specific schemes such as beaver and seals. Species trends were adjusted for changes in sampling efforts. A broad range of distribution data was used to estimate the presence and numbers of specific species. The exact and detailed descriptions of the data can been found in Zoogdiervereniging VZZ (2007).

## The Netherlands official national criteria

Between 1994 and 2002 18 national Red Lists have been drawn up for the Netherlands and published in the Government Gazette by the Dutch minister of ANF. These lists cover 18 different taxonomic groups: all five groups of vertebrates, nine groups of invertebrates and four groups of plants and fungi. These first generation Red Lists were drawn up using categories taken from a draft version of the IUCN criteria (subsequently published as IUCN, 1995). As the precise details of the IUCN criteria were not known, the Dutch Ministry of ANF drew up its own criteria (figure 1). In essence, these criteria aimed at identifying species that were (more or less) rare and have been in decline (more or less) since 1950. These species are classified as either Critically Endangered (CR), Endangered (EN) or Vulnerable (VU). Species that either are extremely rare or are still common but have declined more than 50% are listed in the category Near Threatened (NT). Species that have disappeared are listed as Extinct (EX) (ten years after the last documented reproduction) or Extinct in the Wild (EXW) if there is an existing captive breeding population in the Netherlands, which could be used for reintroduction. The criteria can be applied at two levels: population size and, except for cetaceans, also area of occupancy (on the basis of 5 x 5 km squares). More detailed information about the criteria and the categories used can be found in Zoogdiervereniging VZZ (2007).

## IUCN Red List criteria and Regional guidelines

It is not necessary to list the IUCN criteria (IUCN 2001) and regional guidelines (IUCN 2003) in this paper in detail, as they are readily available in English on the IUCN website (www.iucnredlist.org). The IUCN Red Lists exist to show the risk of extinction faced by individual species. Major criteria for including species on a Red List are a high rate of decline over the last ten years or three generations, whichever is longer and/or very low population numbers. So the reference period for a measured decline is very different: the Dutch criteria use the baseline year 1950, as opposed to ten years or three generations (IUCN criteria A, C and E), which provide a shifting baseline.

The IUCN regional guidelines are mainly intended to evaluate the position of species on national Red Lists in the light of that species status in a broader regional context and, as such, take the populations in adjacent areas into account. These guidelines can help identify whether the status of a species should be upgraded or downgraded, normally by one threat category. The IUCN has developed a protocol for applying these regional guidelines in which criteria, including life history, dispersal capacity and reproduction ecology in a regional or local setting are used to assess the status of species.

## Red List indicator

The 1994 and 2006 Red Lists, drawn up using the Dutch criteria, were compared to provide a Red List indicator. The same species were assessed in each period. For each period, the number of species per category was weighted by a different factor (5 for Extinct species, 4

for Critically Endangered species, 3 for Endangered species, 2 for Vulnerable species and 1 for Near Threatened species). The scores per category were then summed for each period. The sum for the first period was set at an index value of 100, with the sum in the second period being indexed relative to this, so the indicator effectively expresses the percentage change in the sums (as in figure 3). If more species come to be at a higher threat status the value of this index will increase.

Our Red Lists indicator resembles the Red List indicator developed by Butchart et al. (2005, 2007), who used the same weights per threat category as we did and also set the first value at 100. However there are some differences between the two analyses. Butchart et al. use IUCN categories and their indicator has a lower value if more species have a higher threat status over time. The latter is, in our opinion, a less elegant way of expressing change of threat over time.

## Results

### Comparison of the first and the second national Red Lists of mammals

The 2006 national Red List of mammals includes 24 species: three Extinct in the Netherlands, one Extinct in the wild in the Netherlands, two Critically Endangered, two Endangered, nine Vulnerable and seven Near Threatened (table 1). To properly compare the new list with the previous one, the method currently in use was applied (partly with improved data) to the 1994 situation. The reconstructed 1994 Red List comprises 20 species.

Generally speaking the species living in agricultural landscapes are faring worse than in 1994, but marine mammals and most bats are doing better. The arrows in figure 2 indicate two notable shifts between categories between 1994 and 2006. The white arrow represents Geoffroy's bat (*Myotis emarginatus*) and harbour porpoise (*Phocoena phocoena*), which both changed from Critically Endangered to Vulnerable. The grey arrow represent four species which are currently Near Threatened species, which were not even on the Red list in 1994: rabbit (*Oryctolagus cuniculus*), serotine (*Eptesicus serotinus*), stoat (*Mustela erminea*) and weasel (*Mustela nivalis*).

### Change of threat of species groups

Between 2004 and 2008 second generation Dutch Red Lists have been published for five species groups. Comparisons with the first generation Red Lists by means of the Red List Indicator shows that the overall degree of threat to mammals, reptiles, amphibians, birds and butterflies has increased by seven percent (figure 3). This is despite the goal of Dutch and European nature policy that the degree of threat should not increase. However, this has only been achieved for mammals, where the index value is 87 (compared to 100). For all the other groups, i.e. birds, reptiles, amphibians and butterflies, the level of threat has increased.

### The IUCN Regional Red List of mammals of the Netherlands

The IUCN Regional Red List of mammals of the Netherlands is shown in table 2. There are 30 species on this list as IUCN also includes the category "Data Deficient". Taxa in all of the IUCN categories, except Least Concern and Not Evaluated, are normally presented in the Red List and such species are referred to as "Red Listed" (IUCN 2006, IUCN 2008a).

The application of the regional guidelines has led to a change in the Red List category for just four species. Parti-coloured bat (*Vespertilio murinus*) and Geoffroy's bat have been downgraded, because probably there is significant immigration and the immigration is not expected to decrease. Harbour porpoise and garden dormouse have been upgraded,

Table 1. Comparison of the 1994 Red List of mammals of the Netherlands (Government Gazette 1995 no. 23, taking into account corrections as published in the Government Gazette 2004 no. 218), the reconstructed 1994 Red List of mammals (based on revised criteria and better data, see: Zoogdiervereniging VZZ (2007)) and the 2006 national Red List of mammals. The species are placed in taxonomical order; categories outside the national Red List are shown in brackets: NE (Not Evaluated), DD (Data Deficient) and LC (Least Concern).

| Common name | Scientific name | 1994 Red List Category | Reconstructed 1994 Red List Category | 2006 Red List Category | 2006 Red List Criteria* |
|---|---|---|---|---|---|
| rabbit | *Oryctolagus cuniculus* | (LC) | (LC) | NT | 16 |
| bi-coloured white-toothed shrew | *Crocidura leucodon* | NT | (LC) | (LC) | 2 |
| water shrew | *Neomys fodiens* | VU | (DD) | VU | 7 |
| lesser horseshoe bat | *Rhinolophus hipposideros* | EX | EX | EX | |
| serotine | *Eptesicus serotinus* | (LC) | (LC) | VU | 7 |
| noctule | *Nyctalus noctula* | (LC) | VU | VU | 7 |
| brown long-eared bat | *Plecotus auritus* | (LC) | VU | (LC) | 3 |
| grey long-eared bat | *Plecotus austriacus* | NT | EN | VU | 5 |
| parti-coloured bat | *Vespertilio murinus* | (NE) | (NE) | NT | 1 |
| Geoffroy's bat | *Myotis emarginatus* | EN | CR | VU | 5 |
| greater mouse-eared bat | *Myotis myotis* | EN | EX | EX | |
| Natterer's bat | *Myotis nattereri* | VU | VU | (LC) | 3 |
| grey seal | *Halichoerus grypus* | NT | NT | NT | 1 |
| common seal | *Phoca vitulina* | VU | EN | VU | 6 |
| otter | *Lutra lutra* | EX | EX | EX | |
| pine marten | *Martes martes* | VU | VU | VU | 6 |
| stoat | *Mustela erminea* | (LC) | (DD) | NT | 16 |
| weasel | *Mustela nivalis* | (LC) | (DD) | NT | 12 |
| fallow deer | *Dama dama* | EN | VU | (LC) | 2 |
| bottlenose dolphin | *Tursiops truncatus* | EXW | EXW | EXW | |
| harbour porpoise | *Phocoena phocoena* | CR | CR | VU | 7 |
| garden dormouse | *Eliomys quercinus* | VU | CR | CR | 13 |
| common dormouse | *Muscardinus avellanarius* | NT | EN | EN | 9 |
| European beaver | *Castor fiber* | NT | (NE) | NT | 1 |
| root vole | *Microtus oeconomus* | VU | VU | VU | 7 |
| common hamster | *Cricetus cricetus* | CR | CR | CR | 13 |
| yellow-necked mouse | *Apodemus flavicollis* | NT | NT | NT | 1 |
| black rat | *Rattus rattus* | (LC) | VU | EN | 10 |
| number of Red List species | | | 20 | 24 | |

* see numbers in figure 1.

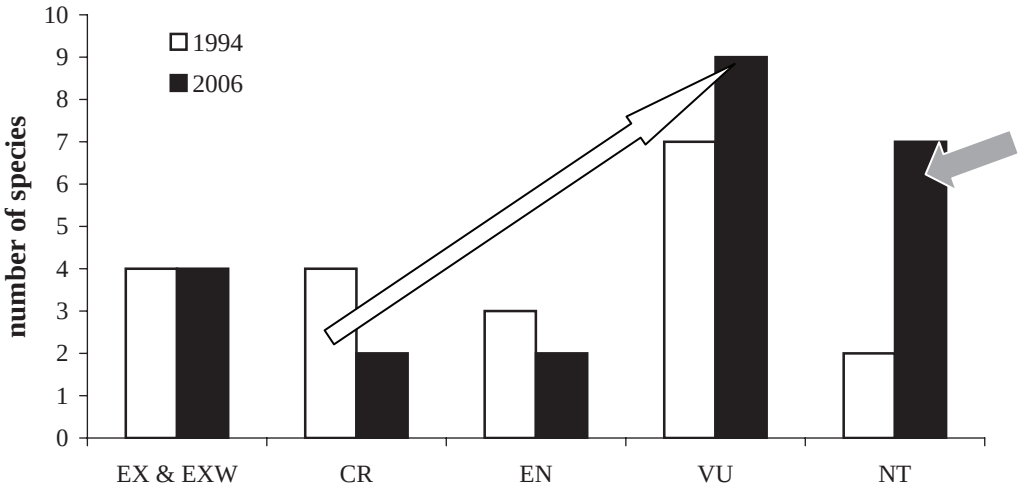


Figure 2. The number of mammals per Red List category in the Netherlands in 1994 and 2006. Arrows indicate two notable shifts between categories between 1994 and 2006. White arrow: the change of Geoffroy's bat (*Myotis emarginatus*) and harbour porpoise (*Phocoena phocoena*) from Critically Endangered to Vulnerable. Grey arrow: four species, which were not on the Red List in 1994, which are currently Near Threatened species: rabbit (*Oryctolagus cuniculus*), serotine (*Eptesicus serotinus*), stoat (*Mustela erminea*) and weasel (*Mustela nivalis*).

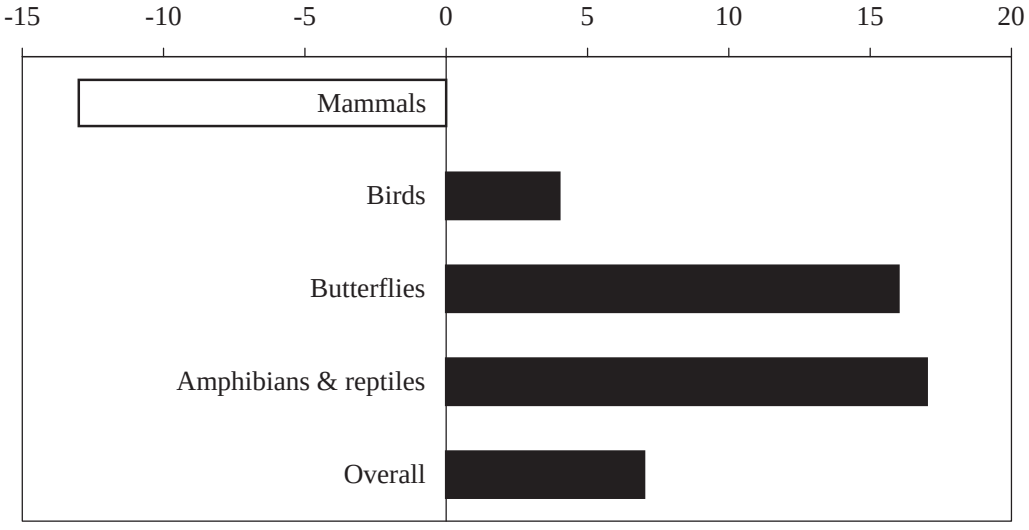


Figure 3. Percentage change in degree of threat (Red List indicator) of five species groups in the Netherlands between (around) 1994 and 2005. Only the situation of mammals is improving (source: Statistics Netherlands).

Table 2. Regional Red List of mammals of the Netherlands according to IUCN criteria. Step 1 is the result of the application of the standard criteria, 'Final category' is the result after the application of the regional guidelines (resulting in upgrading or downgrading). Entries in bold shown in the right hand column show species that were upgraded or downgraded. RE = regionally extinct (within the Netherlands).

| Species | Scientific name | IUCN Red List criteria (IUCN 2001) | Step 1 | Final IUCN category |
|---|---|---|---|---|
| brown hare | *Lepus europaeus* | A2b | NT | NT |
| rabbit | *Oryctolagus cuniculus* | A2bd | EN | EN |
| western hedgehog | *Erinaceus europaeus* | A2b | NT | NT |
| water shrew | *Neomys fodiens* | | DD | DD |
| greater horseshoe bat | *Rhinolophus ferrumequinum* | | RE | RE |
| lesser horseshoe bat | *Rhinolophus hipposideros* | | RE | RE |
| Leisler's bat | *Nyctalus leisleri* | C2a(i) | CR | CR |
| noctule | *Nyctalus noctula* | C1 | VU | VU |
| barbastelle | *Barbastella barbastellus* | | RE | RE |
| grey long-eared bat | *Plecotus austriacus* | D1 | EN | EN |
| parti-coloured bat | *Vespertilio murinus* | D1 | EN | VU |
| Bechstein's bat | *Myotis bechsteinii* | D1 | CR | CR |
| Brandt's bat | *Myotis brandtii* | D1 | EN | EN |
| Geoffroy's bat | *Myotis emarginatus* | D1 | VU | NT |
| greater mouse-eared bat | *Myotis myotis* | D1 | CR | CR |
| otter | *Lutra lutra* | D1 | CR | CR |
| pine marten | *Martes martes* | D1 | VU | VU |
| stoat | *Mustela erminea* | A2b | EN | EN |
| weasel | *Mustela nivalis* | A2b | EN | EN |
| western polecat | *Mustela putorius* | | DD | DD |
| bottlenose dolphin | *Tursiops truncatus* | | RE[W] | RE[W] |
| harbour porpoise | *Phocoena phocoena* | | LC | NT |
| garden dormouse | *Eliomys quercinus* | A2a + B2ab(ii,iv,v) + C1 + D1 | EN | CR |
| common dormouse | *Muscardinus avellanarius* | B2ab(iii)c(iv) + C1 | EN | EN |
| European beaver | *Castor fiber* | D1 | EN | EN |
| montane water vole | *Arvicola scherman* | | DD | DD |
| root vole | *Microtus oeconomus* | B2ab(iii) | VU | VU |
| common pine vole | *Microtus subterraneus* | | DD | DD |
| common hamster | *Cricetus cricetus* | B2ac(iv) | CR | CR |
| yellow-necked mouse | *Apodemus flavicollis* | D2 | VU | VU |

The garden dormouse (*Eliomys quercinus*) is nationally the rarest species on the Dutch Red List of Mammals. *Photograph: © Vilda -Rollin Verlinde.*

because immigration is expected to decrease and the Dutch population probably is a sink.

## Discussion

### Comparison of the national Red List of mammals and the IUCN Regional Red List for the Netherlands

Comparing the 2006 national Red List of mammals with the IUCN Regional Red List shows that 68% of the species (39 out of 57) are in the same category. De Iongh and Bal (2007) did a similar comparison for butterflies, reptiles and amphibians and for vascular plants and had similar findings. They found that threat categories for individual species were the same for at least 70% across both types of Red Lists. However they found a marked exception when comparing the Red Lists for birds, as only 35% of the risk categories in the national Red List are the same as in the regional IUCN Red List. De Iongh and Bal (2007) suggest that the experts involved in the assessment of the Red List of birds had been overly strict in applying the new IUCN Categories and Criteria and had not made sufficient use of expert opinion, which may have resulted in the list based on IUCN criteria showing a much higher level of threat. This is in contrast to the situation in the UK, where Eaton et al. (2005) in comparing the national Red List for birds in the UK with the IUCN Categories and Criteria found that the IUCN Red List depended heavily upon subjective decisions made during the assessment. Apparently, in the case of the IUCN Regional Red List of mammals of the Netherlands a good balance existed between application of the criteria and reliance on subjective expert opinion.

Four mammal species that are Red Listed under Dutch criteria are not found on the IUCN Regional Red List: black rat (*Rattus rattus*), serotine, common seal (*Phoca vitulina*) and water shrew (*Neomys fodiens*). Under the IUCN criteria harbour porpoise and Geoffroy's bat are classified one category of threat lower and three species are classified one category of threat higher: yellow-necked mouse (*Apodemus flavicollis*), parti-coloured bat and grey long-eared bat (*Plecotus austriacus*). Using IUCN criteria four species are classified two categories of threat higher (beaver (*Castor fiber*), stoat, rabbit and weasel) and two species that are not Red Listed under Dutch criteria do appear in the IUCN Regional Red List: western hedgehog (*Erinaceus europaeus*) and brown hare (*Lepus europaeus*).

Thus the application of the IUCN criteria gives a more negative picture than the Dutch criteria (figure 4). It is clear that both methods have advantages and disadvantages. As already mentioned, we do not think that subjective decisions by experts have played a major role in the case of the Red List of mammals, so this suggest a real difference between the two sets of criteria, with the IUCN tending to be more precautionary and thus giving more emphasis to extinction risk. This is particularly the case with species that are still quite common, like the rabbit.

Differences between the two Red Lists can be explained by several factors. Very rare species with since 1950 stable or even increasing populations are listed as Near Threatened under Dutch criteria, but as Endangered or even Critically Endangered under IUCN criterion D. In the case of a decline the reference period is very different: since 1950 (Dutch criterion) instead of ten years or three generations (IUCN criteria A and C1). That means that species which have declined from common (1950) to rather rare (at present) but whose populations have remained more or less stable over the last ten years are red listed under Dutch criteria but are classified as Least Concern according to the IUCN criteria. For the calculation of a Red List Indicator over a longer time span (since 1950) this difference makes the IUCN Categories and Criteria less applicable than the Dutch criteria. The IUCN criteria are mainly meant to assess actual extinction risk in the near future, often based

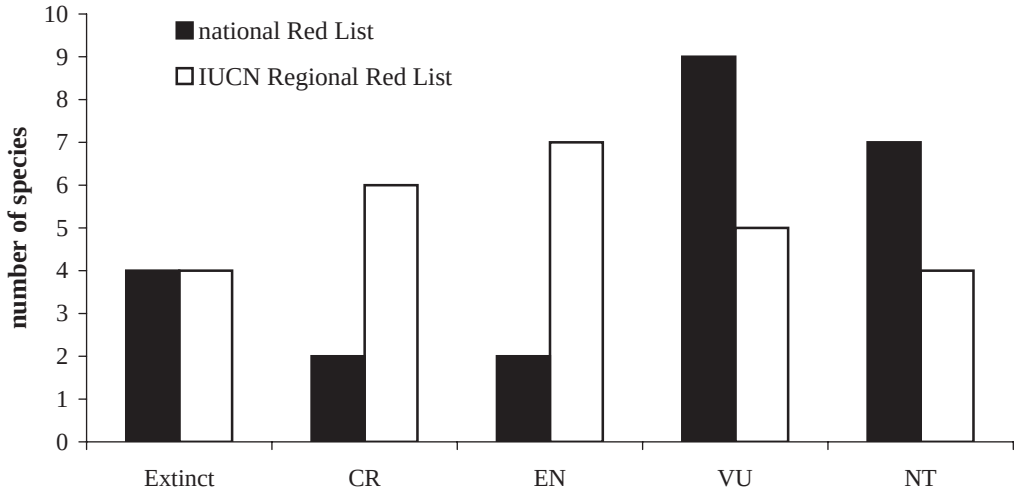


Figure 4. Comparison of the number of species per category under Dutch (black) and IUCN criteria (white).

on limited species data, and in that sense they are more precautionary. The Dutch criteria are more realistic and applicable in the Dutch situation, because they take into account the historical area of occupancy and population size of the species concerned.

## Comparison of the Dutch Red Lists of mammals and the IUCN global Red List

When comparing the Dutch Red List of mammals with the IUCN global Red List, one finds substantial differences. Only six species on the Dutch Red Lists (drawn up under both sets of criteria) are on the 2008 IUCN global Red List, namely rabbit, barbastelle, Bechstein's bat, pond bat (*Myotis dasycneme*), garden dormouse (*Eliomys quercinus*) and otter (*Lutra lutra*) (IUCN 2008b). On the global level these are all classified as Near Threatened. With the exception of the regionally extinct barbastelle, the Netherlands has an important responsibility to play in conserving these species. The IUCN Regional Red List of European mammals (Temple & Terry 2007) contains the same species, together with greater horseshoe bat and harbour porpoise. Bechstein´s bat and harbour porpoise are Vulnerable at the European level, the other six species classified as Near Threatened.

## Threats

The main threats to Red Listed Dutch mammal fauna are of human origin: intensified land use and thoughtless or inadequate management measures (Jansen & Huitema 1997, Wansink & Huitema 1997).

Land use in the Netherlands has greatly intensified since 1950. Although a large part of heath land had already disappeared before this time, the agricultural landscape remained relatively species rich. But over the last 60 years the great majority of agricultural areas have become transformed into highly productive rye-grass pastures or arable land. Large-scale land consolidation projects were carried out to achieve this, resulting in the disappearance of unproductive elements of the landscape (such as hedgerows, rough field margins and small marshes) (Koomen et al. 2007) and an overall lowering of the water table. Consequently species that inhabit varied agricultural landscapes (stoat, hamster etc.) and wetlands (root vole, water shrew etc.) have declined in number.

Two species that inhabit wetlands have

recently been reintroduced: the beaver and the otter. The beaver is rare but increasing, due to nature development projects along several rivers, the otter population is also slowly increasing, although it is still severely affected by road casualties.

Thoughtless or inadequate management measures provide an other important source of threats. For example, the common dormouse (*Muscardinus avellanarius*) lives in bramble thickets along forest edges, but forest owners (and sometimes even nature conservation organizations) frequently cut these thickets. Sometimes trees within a row used by bats for orientation during foraging are cut down leaving a gap that is too large for the bats to navigate across. In other cases old trees are cut because of falling dead branches (and the presumed dangers for people), without the owner paying sufficient attention to their importance for the pine marten (*Martes martes*) or as a breeding colony for bats. Several other species (voles, shrews, martens) are also affected by the management of the (remaining) unproductive parts of the countryside, such as parks where the owners can be too tidy, for example, by removing heaps of leaves or branches. Lack of knowledge of the importance of providing habitats could be more important in these cases than anything else.

Other threats are mostly of minor importance (for example: pollution or predation by domestic cats) or apply to just one or two species (for example: the impact of fisheries on the harbour porpoise). As yet there is no proof that climate change has had a negative impact on mammal species in the Netherlands and some even claim that climate change may be one of the factors for the increase of some species of bats.

## Conclusions

We draw two main conclusions from this analysis. First, sound expert opinion can prevent IUCN Regional Red lists being overly negative and tending to overestimate extinction risk. There is mixed news on the status of Dutch mammal fauna: on a positive note this has slightly improved in recent years, but this is countered by the growing length of the national Red List which shows that the situation is much worse than it was sixty years ago.

## References


Butchart, S.H.M., A.J. Stattersfield, L.A. Bennun, H.R. Akçakaya, J.E.M. Baillie, S.N. Stuart, C. Hilton-Taylor & G.M. Mace 2005. Using Red List Indices to measure progress towards the 2010 target and beyond. Philosophical Transactions of the Royal Society of London B 360: 255–268.

Butchart, S.H.M., H.R. Akçakaya, J. Chanson, J.E.M. Baillie, B. Collen, S. Quader, W.R. Turner, R. Amin, S.N. Stuart & C. Hilton-Taylor 2007. Improvements to the Red List Index. PLoS ONE 2 (1): e140. doi: 10.1371/journal.pone.0000140. Available from the internet, accessed 15 May 2009. URL: http://dx.doi.org/10.1371%2Fjournal.pone.0000140.

de Iongh, H.H. & D. Bal 2007. Harmonization of Red Lists in Europe: some lessons learned in the Netherlands when applying the new IUCN Red List Categories and Criteria version 3.1. Endangered Species Research 3: 53-60. Available from the internet, accessed 15 May 2009. URL: http://www.int-res.com/articles/esr2007/3/n003p053.pdf.

Eaton, M.A., R.D. Gregory, D.G. Noble, J.A. Robinson, J. Hughes, D. Procter, A.F. Brown & D.W. Gibbons 2005. Regional IUCN Red Listing: the Process as applied to birds in the United Kingdom. Conservation Biology 19 (5): 1557-1570.

IUCN 1995. IUCN Red List Categories. IUCN Species Survival Commission. IUCN, Gland, Switzerland.

IUCN 2001. IUCN Red List Categories and Criteria: Version 3.1. IUCN Species Survival Commission. IUCN, Gland, Switzerland.

IUCN 2003. Guidelines for Application of IUCN Red List Criteria at Regional Levels: Version 3.0. IUCN Species Survival Commission. IUCN, Gland, Switzerland.

IUCN 2006. Guidelines for Application of IUCN Red List Criteria at Regional Levels: Version 6.2. IUCN Species Survival Commission. IUCN, Gland, Switzerland.

IUCN 2008a. Guidelines for Application of IUCN Red List Criteria at Regional Levels: Version

7.0. IUCN Species Survival Commission. IUCN, Gland, Switzerland.
IUCN 2008b. 2008 IUCN Red List of Threatened Species. Available from the internet, accessed 15 May 2009. URL: http://www.iucnredlist.org
Jansen, E. & H. Huitema 1997. Vleermuizen. In: Vereniging Flora en Fauna. Jaarboek Natuur 1997. De verlies- en winstrekening van de Nederlandse natuur: 206-228. KNNV Uitgeverij, Utrecht, the Netherlands.
Koomen, A.J.M., G.J. Maas & T.J. Weijschede 2007. Veranderingen in lijnvormige cultuurhistorische landschapselementen. Resultaten van een steekproef over de periode 1900-2003. WOt-rapport 34. Wettelijke Onderzoekstaken Natuur & Milieu, Wageningen, the Netherlands.
Mitchell-Jones, A.J., G. Amori, W. Bogdanowicz, B. Kryštufek, P.J.H. Reijnders, F. Spitzenberger, M. Stubbe, J.B.M. Thissen, V. Vohralík & J. Zima (eds.) 1999. The Atlas of European Mammals. Poyser, London, UK.
Temple, H.J. & A. Terry (eds.) 2007. The Status and Distribution of European Mammals. IUCN Red List of Threatened Species – Regional Assessments 3. Office for Official Publications of the European Communities, Luxembourg, Luxembourg.
Wansink, D. & H. Huitema 1997. Zoogdieren. In: Vereniging Onderzoek Flora en Fauna. Jaarboek Natuur 1997. De verlies- en winstrekening van de Nederlandse natuur: 190-205. KNNV Uitgeverij, Utrecht, the Netherlands.
Wilson, D.E. & D.M. Reeder 2005. Mammal species of the world. A taxonomic and geographic reference. 3rd edition. John Hopkins University Press, Baltimore, USA.
Zoogdiervereniging VZZ 2007. Basisrapport voor de Rode Lijst Zoogdieren volgens Nederlandse en IUCN-criteria. VZZ rapport 2006.027. Second, revised edition. Zoogdiervereniging VZZ, Arnhem, the Netherlands.

## Samenvatting

### De Nederlandse Rode Lijst Zoogdieren van 2006 en een IUCN regionale Rode Lijst

Zoogdiervereniging VZZ heeft in 2006 in opdracht van het ministerie van LNV een basisrapport geschreven voor een nieuwe Rode Lijst Zoogdieren. De in het wild levende 57 zoogdiersoorten, die zich regelmatig in Nederland voortplanten, zijn beschouwd aan de hand van de officiële Nederlandse criteria. De Zoogdiervereniging VZZ concludeert dat 24 soorten op de nieuwe Rode Lijst horen: 3 in Nederland uitgestorven, 1 in het wild in Nederland uitgestorven, 2 ernstig bedreigd, 2 bedreigd, 9 kwetsbaar en 7 gevoelig. Deze Rode Lijst wordt officieel zodra de minister van LNV deze publiceert in de Staatscourant. Voor een zuivere vergelijking met de vorige Rode Lijst uit 1994 is de huidige methode toegepast (met deels betere gegevens) op de situatie van toen. De hieruit resulterende 'gereconstrueerde Rode Lijst 1994' omvat 20 soorten. De lijst is in twaalf jaar tijds dus iets langer geworden; daar staat tegenover dat de mate van bedreiging op soortniveau nu lager is. Daarnaast heeft de Zoogdiervereniging VZZ een IUCN regionale Rode Lijst Zoogdieren van Nederland opgesteld - volgens de IUCN Categorieën en Criteria uit versie 3.1 (IUCN 2001) - om de toestand in Nederland internationaal te kunnen vergelijken. Voor deze lijst zijn 63 soorten beschouwd: zes meer dan voor de lijst volgens Nederlandse criteria. Die zes extra soorten zijn vleermuizen, die door de strikte Nederlandse criteria voor voortplanten niet in aanmerking komen voor de lijst volgens Nederlandse criteria. De resulterende IUCN regionale Rode Lijst Zoogdieren bestaat uit in totaal 30 soorten, te weten: 3 *Regionally Extinct*, 1 *Regionally Extinct in the Wild*, 6 *Critically Endangered*, 7 *Endangered*, 5 *Vulnerable* en 4 *Near Threatened*. De IUCN rekent ook de categorie *Data Deficient* tot haar Rode Lijst. Het betreft op dit moment in Nederland vier soorten. De overige 33 soorten zijn *Least Concern*. De belangrijkste oorzaken van de bedreiging van bijna de helft van de Nederlandse zoogdieren zijn intensivering van het grondgebruik (met als gevolg: het verdwijnen van geschikte natte gebieden en van kleine landschapselementen en de toename van verkeersslachtoffers), alsmede ondoordacht en nadelig beheer van bijvoorbeeld bossen en niet-productieve delen van het landelijk gebied.

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