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National report on the implementation of the Agreement on the Conservation of Populations of European Bats: 2010-2013

A General Information

Name of Party	Kingdom of the Netherlands
Date of Report	25-3-2014
Period covered	2010-2013
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B Status of Bats within the Territory of the Party

1. Summary Details of Resident Species Summary of recent knowledge on occurrence and distribution

Species	occurrence	Distribution in the Netherlands
Rhinolophus ferrumequinum	extinct	Extinct since the nineteen seventies, but an individual (vagrant/transported?) hibernating in the centre of the country in the mid nineteen nineties
Rhinolophus hipposideros	extinct	Extinct since the early nineteen eighties
Myotis mystacinus	relatively common	Wide spread, but concentrates in the landscape on the higher sandy soils (dunes, central plateau and eastern)
Myotis brandtii	rare	In central and east part, with two roosts in the east
Myotis nattereri	relatively common	Wide spread, but concentrates in the landscape on the higher sandy soils (central plateau and eastern, and in dunes)
Myotis emarginatus	rare	In south east, with two maternity roosts and hibernacula in limestone mines
Myotis daubentonii	common	Wide spread
Myotis dasycneme	rare	Wide spread, but concentrates on the western and north-western lowland regions
Myotis myotis	extremely rare	Concentrates in the southern limestone area, with incidental individuals hibernating in the centre and west of the country
Myotis bechsteinii	extremely rare	Concentrates in the southern limestone area, one known breeding colony, with individuals hibernating spread over the centre east of the country
Pipistrellus pipistrellus	very common	Wide spread
Pipistrellus nathusii	common	Wide spread, but predominantly males and no/hardly females in summer time
Pipistrellus pygmaeus	extremely rare	Occasional records of individuals spread over country. Number of observations growing through new observation techniques
Pipistrellus kuhlii	vagrant/transported	Only found in conjunction with passive transport from the south of Europe
Eptesicus serotinus	common	Wide spread
Nyctalus noctula	common	Wide spread with some concentration on higher sandy soils
Nyctalus leisleri	rare	Predominantly eastern, recently more observations are made
Nyctalus lasiopterus	vagrant/transported	Only found in conjunction with passive transport from the south of Europe
Eptesicus nilssonii	vagrant	A single record in 2003, occasional records on oil platform and a single record in 2011.
Vespertilio murinus	rare	Predominantly western north-western, recently more observations are made
Barbastella barbastellus	extinct	
Plecotus auritus	common	Wide spread, with some concentration on higher sandy soils
Plecotus austriacus	rare	South, south-eastern

Thus far 23 bat species have been recorded in the Netherlands.. Three of these can be considered vagrants: *Pipistrellus kuhlii (records in conjunction with passive transport), Nyctalus lasiopterus* (one record, possibly a case of passive transport) and *Eptesicus nilssonii*. *Eptesicus nilssonii* is sometimes found on oil rigs in the Dutch Exclusive Economic Zone in the North Sea (e.g. Boshamer & Bekker, 2008), rare findings are from the central part of the country in 2003 and validated sound recordings from the northwest of the country in 2011 and 12.
Of the 20 native species 3, *Rhinolophus ferrumequinum*, *Rhinolophus hipposideros* and *Barbastella barbastellus,* are now considered regionally extinct. Maternity colonies have never been recorded for *Rhinolophus ferrumequinum* and *Barbastella barbastellus*. All maternity colonies of *Myotis myotis* and *Rhinolophus hipposideros* known from earlier times have disappeared.

Since the early '90s the occurrence of cryptic species recognisable as different phonotypes was suspected. Between 2002 and 2009 considerable effort was put in targeted acoustic surveys for *Pipistrelles* with best listening frequencies above 53 kHz. Despite these efforts, *Pipistrellus pygmaeus* was only recently discovered in two localities (Cornelis, 2009). Recently the use of automatic bat detectors led to more observations, even where the chance of recording the Soprano pipistrelle is only a fraction of the chance of recording the Common pipistrelle. Roosts of Soprano pipistrelles are still unknown.

Vespertilio murinus is a rare species, records are relatively wide spread, with a tendency towards the north, north-western lower parts of the country. Only one confirmed maternity colony is known in the centre of the country. Recent efforts to find roosts in an area where hunting individuals are frequently observed, were not successful (Jansen et al. 2013).

After having found a maternity roost through checking of attics, in the last 5 years, and using telemetry, i.e. radio transmitters on a caught bat, to try and locate roosts, a number of (maternity) roosts of *Myotis brandtii* have been found in the south-eastern and eastern part of the Netherlands (Spoelstra & Janssen 2010, Jansen 2013).

Through netting and telemetry *Myotis bechsteinii* is found hunting in several older woodland sites in the east of the country and a maternity colony was found in the east and southeast of the Netherlands (Jansen 2011).

Myotis emarginatus has two large and one small maternity roosts in the middle of the province of Limburg (Vergoossen et al. 2009), and a fourth in the south of the province. The small maternity colonies may be satellite colonies from larger colonies in Belgium. The two larger colonies have a number of satellite colonies in the immediate surroundings. Bats from the colonies probably share hibernacula in the south of the Netherlands. In areas between the summer colonies and the main hibernations sites predominantly males are found.

Myotis dasycneme is wide spread with concentrations in the western and north-west lowlands of the Netherlands. The majority of the known Dutch population consists of females. An overview of status and threats was produced in 2011 (Haarsma, A.-J. 2011).

Eptesicus serotinus and *Nyctalus noctula* are both numerous and wide spread. Different experts in had the experience of observing only few specimen when revisiting areas throughout the Netherlands, where these species were relatively abundant. Based on these clear indications of declining populations, both were placed in the national Red List of Threatened Mammals (VU).

Pipistrellus nathusii is a common and wide spread species. From the second half of May to the first half of August, the majority of its population consists of males; in contrast with autumn, winter and spring, when they are joined by migrating females. In the period 2010-2013 small groups were found (Jansen et al. 2013), but no confirmed maternity colony was recorded. In autumn mating groups are regularly found in bat boxes.

Presence of *Plecotus austriacus* is limited to the south of the Netherlands (e.g. Goossens & van Overmeire 2013). *Myotis mystacinus, Myotis nattereri, Plecotus auritus, Myotis daubentonii and Pipistrellus pipistrellus* are wide spread species.

2. Status and Trends

In 2006, the former Ministry of Agriculture, Nature and Food Quality (ANF) commissioned the Dutch Mammal Society to draft the second Red List of Mammals. The assessment was done according to national criteria and according to the IUCN criteria with application of the regional guidelines. The proposed Red List (Zoogdiervereniging VZZ, 2007) was formalised by the Dutch government on 4th September 2009 by publication in the *Staatscourant* (Government Gazette) website with number 2009-13201. So, from 2009 it has replaced the Red List of Mammals issued in 1994. There is no effort yet to update the assessment with more recent data. A mammal atlas is being prepared for publication in 2014, therefore most recent data are not yet published and available.

Red list status and population estimates of all bat species of the Netherlands (Zoogdiervereniging VZZ, 2007).

Species	Population estimates	Trend	IUCN Red List category
Rhinolophus ferrumequinum	-		regionally extinct
Rhinolophus hipposideros	-		regionally extinct
Myotis mystacinus	4,000 – 6000 [1]	+ [5]	least concern
Myotis brandtii	50 - 125 [1]	+ [5]	endangered
Myotis nattereri	6650 – 19200 [1]	++ [6]	least concern
Myotis emarginatus	500 - 900 [1]	++ [6], ++ [7]	near threatened
Myotis daubentonii	18700 - 41700 [1]	+ [6]	least concern
Myotis dasycneme	12,000 - 19,000	+ [6]	least concern
Myotis myotis	25 – 50 [1, 2]	+ [6]	critically endangered
Myotis bechsteinii	<75 [3]	?	critically endangered
Pipistrellus pipistrellus	300,000 - 600,000	?	least concern
Pipistrellus nathusii	50,000 - 100,000	?	least concern
Pipistrellus pygmaeus [4]	Unknown	?	not yet assessed
Eptesicus serotinus	25,000 - 40,000	? / - [9]	least concern
Nyctalus noctula	4,000 – 6,000	? / - [9]	vulnerable
Nyctalus leisleri	50 - 100 [1]	?	critically endangered
Nyctalus lasiopterus	-		not assessed
Eptesicus nilssonii	-		not assessed
Vespertilio murinus	100 - 250	?	vulnerable
Barbastella barbastellus	-		regionally extinct
Plecotus auritus	6000 - 10000 [1]	+ [8]	least concern
Plecotus austriacus	350 – 500 [1]	+ [8], ++ [7]	endangered

[1] Derived from estimates from HRD report.
[2] Hibernating animals only.
[3] About five animals are counted in the hibernacula yearly. At swarming sites, 58 animals were caught in 2008 (Janssen et al. 2008).
[4] As this species was discovered in summer 2008 only, no population estimates are available yet. It is expected that the population is very small.
[5] trend hibernacula, no distinction between *M. mystacinus and M. brandtii*
[6] trend hibernacula
[7] trend maternity roosts on (church) attics
[8] trend hibernacula, no distinction between *P. auritus and P. austriacus*
[9] no real trend data available, indications for negative trend (see text)
+ = moderate increase, ++ = strong increase, ? = no trend available, - = moderate negative trend

Trends in species with a current status of extinct, rare, or endangered

The former distribution of both *Rhinolophus* species was restricted to Southern Limburg. Of *Rhinolophus ferrumequinum* there are no records in its historical range since 1986 and for *Rhinolophus hipposideros* there are no records since 1983. *Barbastella barbastellus* has not been recorded since 1994.

The current winter population of *Myotis myotis* is small and moderately increasing. Maternity colonies are no longer known since the 1960s, but a small colony was discovered in Belgium, close to the Dutch border, in 2009, when a lactating female was radio tracked from the Netherlands. Hibernation occurs predominantly in the limestone mines in the southern part of the province of Limburg, but recently individuals are irregularly observed in hibernacula in a central zone of the country.

Myotis bechsteinii is an extremely rare species, but females with signs of reproduction have been caught at autumn swarming sites near Dutch hibernacula in 2006, 2007 and 2008. In 2009, a maternity colony was found in a wood (Savelsbos) near Maastricht. It might be more common than the records indicate (Janssen et al. in prep). Hibernation occurs predominantly in the limestone mines in the southern part of the province of Limburg, but recently individuals are irregularly observed in hibernacula in the centre east of the country. Numbers are too small for a meaningful trend calculation.

Myotis brandtii and *Nyctalus leisleri* are rare species of the east of the Netherlands. Due to more and more targeted survey activities the numbers of records of both species are increasing. *Myotis brandtii* has been observed in woods in the southeast of the country. Recently *Nyctalus leisleri* has been observed in different localities in the eastern halve of the country. For both species numbers are too small for a meaningful trend calculation.

Plecotus austriacus is a rare species of the south of the Netherlands. Available information on trends suggests an increasing population (e.g. Buys et al. 2009, Network Ecological Monitoring church attics 2013).

3. Habitats and Roost Sites

Hollows, crevices and loose bark of trees are the only available natural roosts for bats in the Netherlands.

There are, however, many types of man-made constructions available that can be used by bats either in summer or winter. Available man-made structures vary from limestone mines, ancient fortresses, ice-houses, bunkers, cellars to spaces under roofs, cavity walls and covering of buildings. Bat boxes are being applied in several localities. In recent years ‘bat boxes’ of diverse types are being used more and more, also as a mitigation measure.

In the Netherlands wetlands are key feeding habitats for bats, especially for *Myotis dasycneme*, *Myotis daubentonii* and *Nyctalus noctula.* This is also the case with *Pipistrellus nathusii*, especially for wetlands near older forests or estates. Recently 22 wetlands have been designated as Natura 2000 sites, because of their importance for *Myotis dasycneme.*

For the long range migrating species *P. nathusii* and *N. noctula*, forest sites with older plots and older tree lanes near the migrating routes along the rivers and the coast are important traditional roosting and mating sites.

Many underground sites such as the limestone mines in the south of Limburg, but also ice houses in ancient estates and the ancient fortresses of the Dutch Water Defence Lines, are long known important hibernacula. Recent targeted research has demonstrated that many of these localities are themselves, or incorporate important swarming and mating sites (Janssen et al. 2008, Limpens et al. 2007, Limpens & Jansen 2007).

Due to obligatory survey work in the process of planning and development (restoration and/or demolition) with respect to housing estates and monuments more and more mass hibernacula of *Pipistrellus pipistrellus* are being discovered, and experience and methods to actively find them are increasing.

4. Threats

The threats to bat populations in the Netherlands are, in no particular order:

- Loss of suitable living spaces due to

a) Reconstruction of roof cavities;
b) no/less availability of roost sites in recent architecture
c) Insulation of cavity walls and roofs of buildings (policy targeted at reducing fuel consumption and CO^2 emission; possible effects on biodiversity were not assessed);
d) Felling of hollow trees; felling of exotic tree species, restoration of tree lane structures in estates; gap in age of trees between older cultural sites with old trees (lanes and estates) and trees in other forest plots, resulting in faster rate of loss of tree cavities than in creation of tree cavities; Rose-ringed parakeet; In combination a net loss of available tree cavities);
e) Development of older housing estates and factories; development, demolition, renovation;
f) Policy towards economic development of key hibernation sites in limestone mines and ancient fortresses.

- Loss of suitable habitat due to

a) Deterioration and fragmentation of the landscape;
b) Intensification of management in agriculture and forestry;
c) Inappropriate timing of habitat management;
d) Loss of linear landscape elements;
e) Increase of lighting in landscape (for safety as well as aesthetic reasons); available possibilities for bat friendly lighting are often not used;
f) Use of pesticides, anthelmintics and pollution (e.g. PCB's and PAC's in river soils).

Knowledge gaps

- Lack of knowledge on successful mitigation approaches;
- Impact of wind farms;
- Lack of knowledge about occurrence of rare species like *M. bechsteinii, Barbastella barbastellus* (considered extinct), *Myotis myotis, M. emarginatus* and *Plecotus austriacus*;
- Losing possibilities to monitor underground sites through health and safety regulations (see section 15);
- Lack of knowledge with professionals with responsibility to signal risks; lack of professional awareness regarding legal obligations (possibly with the exception of some abundant species), and lack of enforcement of legal obligations; the latter is amplified by the policy of decentralization of legislation tasks to provinces or municipalities.

Despite of these possible threats, a number of species show a positive trend in the hibernacula in the Netherlands.

5. Data Collection, analysis, interpretation and dissemination

Data on the distribution of bats are collected by national and regional natural history organisations, the Dutch Mammal Society as well as by nature site management organizations (such as *Natuurmonumenten*, State Forestry Service) and are entered into compatible databases. There are two internet portals for the entry of wildlife records: www.telmee.nl and www.waarneming.nl. Data are gathered, validated and managed under the responsibility of the Nature Data Authority and in the form of a National Database Flora and Fauna. These data are available for impact assessments. In spring 2014 a restructure of the Nature Data Authority and a merge with the provinces is being implemented, possibly leading to a less centralized approach.

A mammal atlas project has started in 2008 by the Dutch Mammal Society. In spring 2014, the editing process of produces texts and illustrations is ongoing, while the publication date is planned for late autumn 2014.

Many data are gathered in the course of compulsory surveys in the process of planning and development (implementation of the EC Habitats Directive in national legislation). Most (national) authorities require consultants to add data to the national database. Nonetheless in the case of smaller projects and private developers, this has not yet become an automatism and data remain in the grey literature or in unpublished impact assessments.

Counts in hibernacula are another major source of data. The monitoring of hibernating bats in these roosts is done in the framework of the national nature monitoring programme, the Network Ecological Monitoring (NEM), financed by the Ministry of Economic Affairs. The counts are done by volunteers. The scheme is co-ordinated by the Dutch Mammal Society. Statistics the Netherlands calculates trends and indexes and oversees quality of the data.
Every winter period, bats are monitored in 800 – 900 hibernacula across the country. The main hibernacula are limestone mines, 19th century fortresses, World War II bunkers, and ice houses. Data gathering of hibernacula was standardised in 1986. The scheme generates reliable trend data for *M. mystacinus/brandtii*, *M. nattereri*, *M. emarginatus*, *M. myotis*, *M. daubentonii*, *M. dasycneme*, and *Plecotus auritus/austriacus*.

In 2007, a second NEM monitoring scheme using counts of summer roosts on attics was started. This scheme has *Plecotus austriacus* and *Myotis emarginatus* as target species.
The trend and indexes are shown in the table below.

Index and trends of bat species in the Netherlands 2006-2012. Source: Network Ecological Monitoring.

Trend hibernacula	**start 1986**	**index 2006**	**index 2007**	**index 2008**	**index 2009**	**index 2010**	**index 2011**	**index 2012**	**Long term trend**
Myotis emarginatus	100	1456	1475	2108	1761	2191	2445	2603	Strong increase
Myotis nattereri	100	1202	1118	1416	1524	1743	1505	1602	Strong increase
Myotis myotis	100	197	169	284	311	197	221	159	Moderate increase
Myotis daubentonii	100	254	224	213	215	216	217	222	Moderate increase
Myotis dasycneme	100	279	278	311	298	276	324	355	Moderate increase
Myotis myst/brand	100	287	297	322	310	317	334	379	Moderate increase
Plecotus auri/aust	100	222	167	229	230	247	303	219	Moderate increase
Trend roost counts	**1984**								
Myotis emarginatus	100	1417	2143	1428	1512	1525	1892	3124	Strong increase[1]
	1996								
Plecotus austriacus	100	166	78	137	138	216	224	275	Strong increase

A third monitoring scheme, based on transects driven with cars and auto- recording detectors, and targeting *Pipistrellus pipistrellus, P. nathusii, Nyctalus noctula* and *Eptesicus serotinus*, has been successfully tested in 2012/2013, and is being implemented since 2013. For 2014 expanding of this scheme through an increase in numbers of transects will be targeted.

In 2013, the Dutch Mammal Society has started a new initiative, called ''Hopping Detectors'', where automatic ultrasound recorders are used in gardens of the general public for 2 or 3 nights in a row in a single garden. After these 2 or 3 nights, the citizen forwards the recorder to someone in his network for the next recording session. This always leads to interested dialog regarding bats. Data are analysed through volunteer groups, as well as computer aided identification software. Even extremely rare species are being recorded through this nightlong intensive sample of one site. This is a good example of citizen science, where citizen's efforts lead to data of scientific value and public awareness.

C Measures Taken to Implement Article III of the Agreement

6. Legal measures taken to protect bats, including enforcement action

All bat species are strictly protected under the Flora and Fauna Act, which implements article 12 (species protection) of the EC Habitats Directive.

The Netherlands is also a Party to the Convention on the Conservation of European Wildlife and Natural Habitats (Council of Europe, Bern Convention). All bat species, apart from *Pipistrellus pipistrellus*, are listed in Appendix II to this Convention. *Pipistrellus pipistrellus* is listed in Appendix III to the Convention. However, in the Netherlands, *Pipistrellus pipistrellus* has the same legal conservation status as the Appendix II species.

The new Nature Conservation Act, which implements article 6 (site protection) of the EC Habitats Directive, has entered into force on 1 October 2005. Seven native bat species, (*Rhinolophus ferrumequinum*, *Rhinolophus hipposideros*, *Barbastella barbastellus*, *Myotis bechsteinii*, *Myotis dasycneme*, *Myotis emarginatus* and *Myotis myotis)*, are listed in Annex II to this Directive, and their conservation requires the designation of Special Areas of Conservation (SACs). A number of such areas have been selected for some of these species (see Section 7 of this report).

However, due to a lack of data on the occurrence and distribution of *Myotis bechsteinii,* at the date of first selection of sites no SACs have been selected for this species. Although a larger number of swarming *M. bechsteinii* ([58], Janssen et al. 2008) have been caught at the limestone mine Boschberggroeve, which is part of the Natura 2000 site 159 (Sint Pietersberg and Jekerdal), this site is not yet designated for the species. The animals of recently found maternity roosts are not the ones swarming at the limestone mine Boschbergroeve. These are suspected to be a population from Belgium (Janssen 2011, Janssen & Dekeukeleire 2012).

No SACs were selected for both *Rhinolophus* species and for *Barbastella barbastellus* as they are extinct in the Netherlands.

7. Sites identified and protected which are important to the conservation of bats

As mentioned in Section 6, a number of Special Areas of Conservation (SACs) has been selected for some species listed on Annex II of the EC Habitats Directive. Designation decrees, including conservation objectives, have been formulated: 20 foraging areas of *Myotis dasycneme*, 6 areas with hibernacula of *Myotis myotis, Myotis emarginatus* or *Myotis dasycneme*, and 1 area with two maternity roosts of *Myotis emarginatus*. Although for the latter feeding areas and flight routes were not included in the SACs, these fall under the external influence of the SAC.

Additionally for two EC Birds Directive sites (SPAs) conservation objectives for *Myotis dasycneme* have been included in the designation decrees.

Currently, management plans for these SAC and SPAs are being formulated.

27 sites designated under Habitat Directive for bat species

Site Nr.	***Natura 2000 site***	***Species***	***Function***
9	*Groote Wielen*	*Myotis dasycneme*	Feeding area
10	*Oudegaasterbrekken, Fluessen en omgeving*	*Myotis dasycneme*	Feeding area
13	*Alde Feanen*	*Myotis dasycneme*	Feeding area
18	*Rottige Meenthe & Brandermeer*	*Myotis dasycneme*	Feeding area
34	*Weerribben*	*Myotis dasycneme*	Feeding area
35	*Wieden*	*Myotis dasycneme*	Feeding area
39	*Vecht en Beneden-Reggegebied*	*Myotis dasycneme*	Feeding area
57	*Veluwe*	*Myotis dasycneme*	Hibernacula
67	*Gelderse Poort*	*Myotis dasycneme*	Feeding area
72	*IJsselmeer*	*Myotis dasycneme*	Feeding area
73	*Markermeer & IJmeer*	*Myotis dasycneme*	Feeding area
74	*Zwarte Meer*	*Myotis dasycneme*	Feeding area
76	*Veluwerandmeren*	*Myotis dasycneme*	Feeding area
83	*Botshol*	*Myotis dasycneme*	Feeding area
90	*Wormer- en Jisperveld & Kalverpolder*	*Myotis dasycneme*	Feeding area
91	*Polder Westzaan*	*Myotis dasycneme*	Feeding area
92	*Ilperveld, Varkensland, Oostzanerveld & Twiske*	*Myotis dasycneme*	Feeding area
94	*Naardermeer*	*Myotis dasycneme*	Feeding area
95	*Oostelijke Vechtplassen*	*Myotis dasycneme*	Feeding area
97	*Meijendel & Berkheide*	*Myotis dasycneme*	Hibernacula
103	*Nieuwkoopse Plassen & De Haeck*	*Myotis dasycneme*	Feeding area
112	*Biesbosch*	*Myotis dasycneme*	Feeding area
151	*Abdij Lilbosch en voormalig klooster Mariahoop*	*Myotis emarginatus*	Maternity colonies
156	*Bemelerberg & Schiepersberg*	*Myotis dasycneme*	Hibernacula
		Myotis emarginatus	Hibernacula
		Myotis myotis	Hibernacula
157	*Geuldal*	*Myotis dasycneme*	Hibernacula
		Myotis emarginatus	Hibernacula
		Myotis myotis	Hibernacula
159	*Sint Pietersberg & Jekerdal*	*Myotis dasycneme*	Hibernacula
		Myotis emarginatus	Hibernacula
		Myotis myotis	Hibernacula
160	*Savelsbos*	*Myotis dasycneme*	Hibernacula
		Myotis emarginatus	Hibernacula
		Myotis myotis	Hibernacula

2 sites designated under Birds Directive with special attention for bat species

Sites Nr.	Natura 2000 site	Species	Function
12	Sneekermeergebied	*Myotis dasycneme*	Feeding area
93	Polder Zeevang	*Myotis dasycneme*	Feeding area

8. Consideration given to habitats which are important to bats

As reported previously, the Dutch government adopted the Nature Policy Document in June 1990. It was updated in 2000 in the document "Nature for people, people for nature", which is available on the website of the Ministry of ANF. The main objective of Dutch nature policy is to make an essential contribution to a liveable and sustainable society through the conservation, restoration, development and sustainable use of nature and landscape. This main objective should be read in an international context.

Since 1990, many projects and actions have been implemented. The construction of a National Ecological Network (NEN) has also begun. The NEN is a coherent network of areas, forming a sustainable basis for the ecosystems and species considered to be important in the (inter)national context. The network consists of core areas, nature development areas and ecological corridors. The sustainable development is supported by a buffer policy aimed at removing or minimising negative external influences on the core areas. Conservation measures for bat species will be taken partly in the form of habitat conservation, particularly through the creation of the NEN. Since the financial crises, that started around 2008, the process of the development of the NEN has been very much slowed down. In a brochure published by the Ministry of Economic Affairs, Directorate of Nature and Biodiversity (Vooruit met Natuur 2013) citizens and entrepreneurs are challenged to combine (economic) development and nature conservation. The ministry published a new policy for nature conservation (Natuurpact 2013) once again committing to investment in the NEN, and stimulating cooperation with entrepreneurs.

In September 2007 the former Ministry of Agriculture, Nature and Food Quality published a document in English about a new approach of species protection, the so-called habitat-based approach. The new approach focuses on groups of protected species in their habitat rather than on individual species, as was the practice. The single species policy did not always prove effective. The new habitat-based approach is about a protection regime that benefits a range of species. It is targeted at habitats supporting a number of threatened species which makes it much more effective. The new approach aims to protect some 400 endangered plant and animal species, including four bat species, but by protecting habitats rather than single species, many more, less endangered species are likely to benefit as well. For some species however, specific measures will always remain necessary. For some habitats in which larger numbers of bats and/or bat species are found the habitat-based protection plans still need to be developed.

Partly financed by a budget of the former Ministry of Agriculture, Nature and Food Quality for habitat-based approach the city of Utrecht has commissioned the Dutch Mammal Society to create a website on bats in towns www.vleermuizenindestad.nl. This project has led to a working group on ''bats in towns and villages'' within the working group of urban ecologist of the communities. Since 2010, an annual meeting is organized, in co-operation between this working group and the Dutch Mammal Society, addressing topics regarding bats in urban areas. In 2013 e.g. the topic of insulation of wall cavities was addressed. More resources are needed to be able to update the site more regularly.

In the framework of developing sites that are important for bats (hibernation, swarming and other functions) as well as cultural history, such as the limestone mines and ancient fortresses, research and training of professionals targeting at the combination of development and bat conservation have been carried out (e.g. Haarsma 2011, Limpens et al. 2007, Limpens & Jansen, 2007).

9. Activities to promote the awareness of the importance of the conservation of bats

A number of Provincial Landscape Management Foundations co-ordinate and train volunteers to act as free of charge consultants for problems with bat colonies in houses and other buildings, and to deal with injured bats and potential rabies-infected bats. This network is ongoing, but still not covering the whole of the country. The claim to finance these activities is shifting to the municipalities.
Training of professionals consultants for this topic through the National Pest Control Reference Centre has stopped and needs a new impulse.

In 2009-2013, the Dutch Mammal Society continued to offer a diversity of seminars for authorities and consultants (survey methods, effective quick scans and survey work in planning and development, conservation of tree lanes and forests, planning & development in relation to old fortresses and historic estates, impact of artificial light and bat friendly solutions) to improve and involve bat conservation in site management and development & planning processes. Since 2008, the competent authority for compensation and mitigation permits is involved in the seminars.

In 2008 a protocol for best practices in assessment of bats for development and planning projects was adopted by the Netwerk Groene Bureaus (an umbrella organization of green consultancies), the Dutch Mammal Society and the Nature Data Authority, which has since been evaluated and adapted annually.

Between 2012 and 2013 a research grand was issued by the Ministry of Economic Affairs to develop protocols for assessment of impact of wind energy plants on bats, and testing a model for to estimate casualties based on found casualties, acoustic activity, season, weather and landscape data (Brinkmann et al. 2011. Limpens et al. 2013). The use of the protocols will be actively stimulated by the government, wind energy developers and the Dutch Mammal Society.

In 2009 a three day international conference on military heritage and construction techniques, bats and vegetation, was organised by and in buildings belonging to the New Dutch Water Defence Line (Projectbureau Nieuwe Hollandse Waterlinie). At this conference specialists from the different aforementioned fields, as well as authorities and entrepreneurs exploiting the fortresses and landscape of the Water Defence Line, discussed a broad spectrum of relevant issues. In 2011 a brochure regarding bat friendly building, and a brochure and website regarding bats and fortresses was published by the Dutch Mammal Society in co-operation with consultancies and landscape conservation organisations.

The European Bat Night was organised by the Netherlands Bat Group of the Dutch Mammal Society in 2010, 2011, 2012 and 2013 with good result. In 2011 in the Year of the Bat, European bat night was organised more intensively in co-operation between the Netherlands Bat Group and the office of the Dutch Mammal Society, organizing public walks and children's activities on over 90 localities. To achieve this also volunteers of (nongovernmental) Nature Education Organisations were trained and provided with materials. A brochure regarding bats in your house and gardens was published, as well as a children's book on bats and fortresses. Activities were partly supported by the Ministry of Economic Affairs.

In October 2012, the Netherlands Bat Group and BatLife Europe organized an international bat box conference in Utrecht, financially supported by the City of Utrecht, bat box producer Vivara and two consultancies.
Proceedings and videos of presentations are available in English via a website (http://symposium.vleermuiskasten.nl/). Following this initiative a Dutch website targeting collection of data on types of boxes used, results, and monitoring of use of bat boxes as alternative roosts in mitigation, is being developed.

10. Responsible bodies, in accordance with Article III.5 of the Agreement, nominated for the provision of advice on bat conservation and management.
("Each Party shall assign to an appropriate body responsibilities for the provision of advice on bat conservation and management within its territory particularly with regard to bats in buildings. Parties shall exchange information on their experiences in this matter.")

For problems with bats in buildings the municipalities have been appointed as responsible bodies.
Management of Natura 2000 areas are decentralised from national government to provinces.
The first filter of licensing of development and planning applications is decentralized to the communities, when bats are involved the provinces audit the process and issue the licence.
When citizens have ''problems'' with bats, e.g. when a roost provides nuisance, the municipalities are responsible for handling the problem within the legal boundaries. In practice only few municipalities implement this responsibility. In some provinces NGO's are doing this work, with financial aid from some municipalities, in other situations ''pest controllers'' are consulted. However, training for pest controllers regarding bats has not been offered since 2008.

Contrary to the Eurobats regulations, the Kingdom of the Netherlands has not assigned an official body for advice on bats conservation or management. hen national legislation requires it, responsible authorities seek advice from consultancies or independent experts.
The Netwerk Groene Bureaus, network of ecological consultancies and the DMS have developed a protocol for best practice assessment of species, landscape functions and effects. This protocol is updated annually, and is implemented in the vast majority of development and planning projects.
The licencing authority in cooperation with experts from consultancies and DMS have developed best practice guidelines for impact assessment and mitigation for a number of species (*Pipistrellus pipistrellus, P. nathusii, Nyctalus noctula, Myotis daubentonii, Plecotus auritus*). An indicator of effects on bats (and other strictly protected species) of a variety of possible developments in the landscape is developed in cooperation with species experts, and made publically available via internet.
The Kingdom regards the ad hoc advise resulting from these initiatives as adequate.

11. Additional action undertaken to safeguard populations of bats
The Ministry of Economic Affairs, the Netwerk Groene Bureaus and the Dutch Mammal Society have yearly updated and upgraded a best practice guidelines on Impact Assessments. These guidelines formulate the minimal survey effort required for valid EIAs.

In 2013, a study on wind turbines and bats was finalized, with a protocol for monitoring effects on bats. This protocol has been ratified by the Ministry of Economic Affairs.

12. Recent and ongoing programmes (including research and policy initiatives) relating to the conservation and management of bats.

In the period 2011 -2013, and ongoing, standards on how to deal with bats in planning and development have been developed by the licensing authority with the aid of bat specialists. The standards have been formulated for several species which are often encountered in the development and planning process, such as *Plecotus auritus, Nyctalus noctula, Pipistrellus pipistrellus, Pipistrellus nathusii and Myotis daubentonii*.

Bat friendly possibilities for lighting including a bat friendly colour spectrum was performed by the Dutch Mammal Society in co-operation with an expert firm for development of LED light. This was done on request of and with financial support of the Ministry of Transport.

Bats are an important species group in a broader ecological research project targeting effects of light on nature. The project is a co-operation between Wageningen University Research, the Netherlands Institute of Ecological Research and many NGO's including the Dutch Mammal Society. Financial support comes from the National Foundation for Applied Sciences NWO, Philips Lighting and the NAM (Dutch Oil Company).

In 2013 a study on spatial behaviour of *Myotis emarginatus* in the Natura 2000 area Lilbosch-Mariahoop was commissioned by the Province of Limburg, after numbers suddenly declined at one of the roosts. These animals appear to have moved to different roosts (Dekker et al., in prep.) Results will be input for the specific Natura2000 management plan.

The Province of Limburg commissioned a report on the limestone mines, bats and Natura 2000 (Haarsma, 2011).

In 2012, the Province of Noord-Brabant commissioned a study regarding the functionality of bat boxes in forests as well as in mitigation projects in urbane situations (Jansen 2013, Korsten 2012).

The problem of bats and wind turbines is addressed in a larger study (see 9.). Between 2012 and 2013 a research grand was issued by the Ministry of Economic Affairs to develop protocols for assessment of impact of wind energy on bats, and testing a model for to estimate casualties based on found casualties, acoustic activity, season, weather and landscape data (Brinkmann et al. 2011, Limpens et al. 2013). The use of the protocols will be actively stimulated by the government, wind energy developers and the Dutch Mammal Society.

Farmers looking for bats: an initiative (by the Dutch Mammal Society with the Centre for Agriculture and Environment) regarding improvement of possibilities to roost and hunt at farm sites and appreciating the pest control factor of bats. In 2012/2013, a successful pilot was carried out.

Zoonoses
The Central Veterinary Institute of the Wageningen University Research (Lelystad), the National Institute of Public Health (Bilthoven), the Naturalis Biopdiversity Center (Leiden), the Erasmus Medical Centre, and the Laboratory of Food Microbiology of the Wageningen University Research (Wageningen) have running programmes on bat zoonoses. These institutions are represented in the Working Group Bat Zoonoses.
The long running passive surveillance of European Bat Lyssavirus)EBLV', started in 1986, was continued in the years 2010/2013. Until January 1st, 2014, 5,249 bats were tested for EBLV. Active rabies surveillance was mainly carried out on *M. dasycneme* and *M. daubentonii,* however with negative results.
The surveillance on the occurrence of *Salmonella* and *Campylobacter* in bats has been finalized and the results will be published in 2014.
The surveillance on coronaviruses in bats was continued and was extended to bats in Ukraine, France, Luxembourg and Germany. The Schmalhausen Institute of Zoology in Kiev was involved in collecting samples from Ukraine. Individual bats workers were respectively collecting samples in France, Luxembourg and Germany.
Furthermore, international studies were carried out on the occurrence of betacoronaviruses in bats from several European countries and West-Africa (Annan et al. 2013).

Eptesicus serotinus serotinus /Eptesicus serotinus turcomanus
A joint programme of the Central Veterinary Institute of Wageningen University Research (Lelystad), the Schmalhausen Institute of Zoology (Kiev), and the Naturalis Biodiversity Center (Leiden) on the occurrence of *Eptesicus serotinus serotinus* and *E. serotinus turcomanus* in Europa was carried out with DNA-sequencing methods. A publication of the results is in preparation.

Pipistrellus nathusii
The previously reported long-term study on the ecology of *Pipistrellus nathusii* in the Netherlands and its seasonal migration between the Netherlands and Central and Eastern European countries has been finalized. Publications about the results are in preparation.

Myotis dasycneme

Private nature conservation organization Natuurmonumenten bought the “Coenekoop colony”, a building with a large breeding colony of this species in 2008 to safeguard this breeding group. In the Year of the bat a webcam was placed in the colony.

A PhD thesis on the ecology of *Myotis dasycneme* in the Netherlands is in preparation. The current results are reported to the Ministry of Economic Affairs (Haarsma 2012).

Myotis emarginatus
See studies for Natura 2000.

Action plan of the Province of Noord-Brabant
In December 2006, the Province of Noord-Brabant published an action plan for bats (Twisk & Limpens 2006). This programme is still running.

13. Consideration being given to the potential effects of pesticides on bats, and their food sources and efforts to replace timber treatment chemicals which are highly toxic to bats.
As reported previously, the supply and use of remedial timber treatment chemicals is regulated by the Board for the Authorization of Pesticides. The instructions for the use of remedial timber treatment products do not refer to possible hazard to bats. Neither are recommendations given to the industry to minimize any hazard to bats as a result of remedial timber treatment. The use of several harmful chemicals, including pentachlorphenol, has been prohibited for timber treatment.

D Functioning of the Agreement

14. Cooperation with other Range States.

Initiative government, support for NGO / experts:

In 2009, the ‘Projectbureau Nieuwe Hollandse Waterlinie’ organised the `International conference military heritage´ with a full day on bats and military heritage, with participants from several range states.

In 2009 – 2011 the Dutch government funded a BBI MATRA project on Bats and Impact Assessment Guidelines in co-operation with Serbia. This was finalized in 2011 (Paunovic et al 2011).
The Netherlands participated in the Interreg-project “Habitat Euregio” in which among other things a survey was done for bats in woodlands (2010-2013; Janssen 2012).

Governmental supported initiatives by NGOs

Within the Network Ecological Monitoring schemes of the Ministry of Economic Affairs, the Dutch Mammal Society and individual bat workers work closely together on cross-border counts of hibernacula, and a group of volunteers has coordinated the summer roost counts of *Myotis emarginatus* in Belgium and The Netherlands.

Yearly, a group of Dutch bat workers join the count of the hibernacula in Nietoperek, Poland.
The field work group of the Dutch Mammal Society organized summer field camps in Finland (2010), Croatia (2011), Spain (2012) and Bulgaria (2013) to assist local mammal workers and bat workers in surveys.
In cooperation with the Dutch Mammal Society, Germany and Switzerland and by the National Agency for Enterprising Netherlands (Rijksdienst voor Ondernemend Nederland) funded research project regarding the development of protocols for studying bats and wind energy plants was carried out (Limpens et al. 2013).

Initiatives by NGOs, not supported

Bat workers have been attending regional (and helping organisation of) meetings in Belgium, Ireland, Spain, Germany, Lithuania, and UK.

Initiated by the Habitat Foundation and in co-operation with bat workers from the Netherlands, Ukraine and Belarus the workshop ‘’Bats and forest management’’ was organized in Belarus in 2012.

The Dutch Mammal Society and Statistics Netherlands were leading partners in the European Environment Agency commissioned project “A pan-European bat indicator” (Haysom et al. 2014), for which the Ministry of Economic Affairs provided the data from the Network Ecological Monitoring.

15. Measures taken to implement Resolutions adopted by Meeting of Parties

Resolution 2.2, Consistent Monitoring Methodologies

Bat species hibernating in underground habitats are monitored since a long time and include *Myotis myotis* and *Myotis bechsteinii, and* a scheme on the monitoring of bats in roosts on attics runs since 2009. Both schemes were funded by the Ministry of Economic Affairs in the framework of the Network Ecological Monitoring.

In 2013, the Ministry of Economic Affairs commissioned a pilot car based monitoring project, in a similar method as is done is several other Party States.

A pilot project with monitoring and surveying using stand-alone acoustic bat detector systems in urban areas was organized by the Dutch Mammal Society and the City of Utrecht. Pilots were conducted in the larger town of Utrecht, and the smaller towns of Wageningen en Wijchen.

Resolution 2.3: Trans boundary Program: species proposals; and Resolution 2.4, Trans boundary Program: Habitat proposals

The Netherlands has no natural underground habitats for bats but has numerous artificial ones, like limestone mines, (semi-) subterraneous bunkers, ancient fortresses, ice houses, cellars etc. which are serving as underground roosts for bats, mainly being winter roosts. Records of bats in all known underground habitats are available in a central database.

Resolutions 2.7 and 3.3, Format of National Report

This report has been prepared in accordance to the adopted format.

Resolution 3.4, Guidelines for the issue of permits for Bat Ringing activities

The guidelines have not been formally implemented in the Netherlands but bat ringing practice is very limited and falls under Dutch legislation.

Resolutions 2.8, 3.8, 4.9: Implementation of the conservation and management plan, and 4.

Efforts to implement the provisions of article III of the Agreement are presented in this Report and are reported by the Scientific Focal Point at the Advisory Committee Meetings.

Resolution 4.3, Guidelines for the Protection and Management of Important Underground Habitats for Bats.

The identification of the important underground habitats, as required in Resolution 2.4, was carried out by the Ministry of Economic Affairs and the Dutch Mammal Society, and has been submitted by the former to the EUROBATS Secretariat in autumn 2010.

All underground habitats are protected by the provisions of the Flora and fauna Act and are, where appropriate, physically protected against unauthorized entry. Key (artificial) underground hibernacula have received a Natura 2000 status (see Section 7).

Due to safety regulations by the Mining Act, many limestone mines can no longer be entered for the annual hibernating bat census, causing the end of in most cases 80 years long data series.

The Dutch Mammal Society and Noctalis Bad Segeberg organized an international workshop on assessment of bats in underground sites using automatic detection to solve this issue. This meeting was partly supported by the ministery of Economic Affairs.

Resolution 4.4: Bat Conservation and Sustainable Forest Management and resolution 6.12: Bat conservation and sustainable forest management

The types of forests and land management as causing problems for bats in forests have not yet been identified. There are no incentive schemes in use to provide resources for bat conservation measures in forests. Measures are not fully yet taken to identify the management and enhancement of key elements and key areas for bats in forests.

A code of conduct for logging was agreed, and is actively promoted by the State Forestry Service and the Ministry of Economic Affairs to save hollow trees as much as possible and to identify prior to the logging of trees if they are roosts of tree dwelling bats.

The guidelines have not been formally implemented in the Netherlands. The Dutch Mammal Society and other organizations arrange workshops and courses in bat/animal friendly tree lane management. Larger woodland managers and municipalities have protocols to avoid harming bats in trees during wood harvest.

Resolution 4.5, Guidelines for the Use of Remedial Timber Treatment.

Not yet implemented. See also Section 13 of this Report.

Resolution 4.6, Guidelines for the Issue of Permits for the Capture and Study of Captured Wild Bats. and Resolution 5.5: Amendment to Resolution 4.6: Guidelines for the Issue of Permits for the Capture and Study of Captured Wild Bats

The guidelines were translated into the Dutch language. The Ministry of Economic Affairs does not impose these guidelines when issuing permits to capture bats for study purposes. We consider the use of the Birds and Habitats Directive, and its implementation in domestic legislation, as a stringent way to issue permits.

Capture and study of captured wild bats fall under the Flora & Faunawet, which forbids the capture of any wild animals. For the use of such methods for the study of bats, an exemption must be requested by the researcher.

A number of active members of the Dutch Mammal Society formulated guidelines for the capture and handling of bats and developed a free course on methodology. These guidelines are voluntary, and not (yet) adopted by the government. Researchers and members that want to make use of the catch and handle exemption of the Flora & Faunawet of the Dutch Mammal Society are required to

comply to these guidelines, must have followed the course and must hand in a project plan, which is validated by an independent committee.

Resolution 5.2: Bat Rabies in Europe

The passive rabies surveillance of bat rabies is ongoing. From 1986 until January 1st, 2014, 5,249 bats were tested for European Bat Lyssavirus. Active rabies surveillance was mainly carried out on *M. dasycneme* and *M. daubentonii.*

Resolution 5.4: Monitoring Bats across Europe

The Ministry of Economic Affairs and the Nature Data Authority agreed to make national data of bat population counts available for the calculation of European trends and indexes of bat populations. This project was led by the Bat Conservation Trust and the Dutch Mammal Society, and commissioned by the European Environment Agency and was published in January 2014 (Haysom et al. 2014).

Resolution 5.7: Guidelines for the Protection of Overground Roosts, with Particular Reference to Roosts in Buildings of Cultural Heritage Importance.

The guidelines were distributed among bat workers. There are a number of ways by which the protection of over ground roosts are arranged:

The nursery colonies of *Myotis emarginatus* in the monastery Lilbosch and the former nunnery in the village Maria-Hoop have been designated as Natura 2000 sites. In 2013 a study on the animals was commissioned by the Province of Limburg when numbers decreased dramatically.

Special attention is given to the elements of the New Dutch Water Defense Line. A group of volunteers functions as “fortress-guards”, managing and counting smaller elements that can function as hibernacula.

On its own initiative, the Dutch Mammal Society is actively involved in assessment of species and functions and mitigation advice for a number of high value locations (Haarzuilens, Jachtslot, some ancient fortresses).

Resolution 5.12: 2008 – Global Year of the Bat and 6.9 Year of the Bat

In the Year of the Bat, a brochure on bat conservation in gardens (50,000 copies) was published, a webcam was put up in a colony of *Myotis dasycneme,* there was a theme day on bats, a sunrise survey and the Night of the Bat. The Year of the Bat was financed by the Ministry of Economic Affairs. A short movie was produced on a count of the *M. dasycneme* colony.

6.4 Guidelines for the implementation of the EUROBATS Project Initiative (EPI)

The Dutch Scientific Focal Point is member of the EPI Assessment Committee.

Resolution 6.5 Guidelines on ethics for research and field work practices

Some aspects of research and field work fall under the Flora and fauna Act, which allows disturbance, handling or catching of bats only when an exemption has been given. This requires an application including a full research protocol. Invasive research (f.e. taking wing or blood samples) falls under the national legislation on scientific use of animals (wet op Dierproeven) and requires specific permits and licences.

Resolution 6.6 Guidelines for the prevention, detection and control of lethal fungal infections in bats

No national implementation of the guidelines. Within the framework of the national hibernacula census from the Network Ecological Monitoring, the Dutch Mammal Society has urged surveyors of hibernacula to be vigilant for lethal fungal infections in bats, and provided a protocol on how to deal with instances of infected animals.

Resolution 6.7 Conservation and management of critical feeding areas, core areas around colonies and commuting routes

Regarding strict protection of roost by the EC Habitats Directive and its implementation in the Flora and fauna Act, the legal interpretation is such as that not only the roost sensu stricto, but the roost sensu lato, including essential feeding areas and flight paths, within the colonies' network of roosts, routes and feeding areas are to be considered. For this reason, a number of Natura 2000 sites has *Myotis dasycneme* as target species.

Resolution 6.8 Monitoring of daily and seasonal movements of bats

A pilot study on monitoring bats with automated stand-alone detectors in urban areas was commissioned by the City of Utrecht, and could also be implemented in two other smaller towns though funding by private charities.

A number of private initiatives resulted in measuring coastal and off-shore seasonal movements of bats using auditory counts (*Pipistrellus nathusii*) or bat boxes (all species).

Resolution 6.11 Wind turbines and bat populations
(Repeals Resolution 4.7: Wind Turbines and bat Populations; Resolution 5.6: Wind Turbines and Bat Populations: guidelines for the planning process and impact assessments)

The National Agency for Enterprising Netherlands, together with the wind energy industry, has commissioned the Dutch Mammal Society and consultancy Bureau Waardenburg to develop national guidelines for working with bats in the course of development and planning of wind energy plants (Limpens et al. 2013).

Resolution 6.13 Bats as indicators for biodiversity

The European Environment Agency funded the development of a prototype bat indicator, which was led by the Bat Conservation Trust UK, the Dutch Mammal Society and Statistics Netherlands. The Ministry of Economic Affairs allowed the data from the Network Ecological Monitoring – hibernacula counts to be used for this (Haysom et al 2014).

In the course of the planning and development process of high energy electricity transport, a model for prediction of presence of functional habitats for bats was developed by the Dutch Mammal Society and Consultancy TAUW. Initiatives to adapt this model for other landscape types are pending.

Using presence/absence data in correlation with other landscape parameters SOVON (Dutch Centre for Field Ornithology) produced potentiality maps also for bat species, commissioned by the Nature Data Authority.

Resolution 6.15 Impact on bat populations of the use of antiparasitic drugs for livestock

[Urges Parties and Range States to take a precautionary approach to the use of antiparasitic drugs. Limit their impact through the development of efficient non-chemical methods to control

livestock parasites and use of products of least toxicity to non-target species. Encourage research and adopt recommendations in Annex I.]

No implementation. In general, nature management organisations such as the State Forrestry Service applied antiparasitic drugs restrictively.

Resolution 6.16: Implementation of the conservation and management plan (2011-2014)
[Requests parties to report at each Advisory Committee on the implementation of the Action Plan].

See this Report.

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