National Report on Bat Conservation in the Federal Republic of Germany 2010-2013

A. General information

Last revision:	June 2014
Period under review:	1 January 2010 – 31 December 2013
Reporting entity:	Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB), Robert-Schuman-Platz 3, 53175 Bonn
Member of the Standing Committee (StC):	Oliver Schall (BMUB)
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This report was compiled by the Federal Agency for Nature Conservation (BfN) (FG II 1.1, Ruth Petermann) on the basis of the 2013 National Report pursuant to the Habitats (FFH) Directive (BfN & BMU 2012), contributions of the German Länder Baden-Württemberg (Sandra Schweizer, Landesanstalt für Umwelt, Messungen und Naturschutz (State institute for the environment, measurements and nature conservation), using reports of the Sections (Referate) 56 of the four regional councils (Regierungspräsidien): Dr. Friedrich Kretzschmar, Regierungspräsidium Freiburg (Freiburg regional council), Oswald Jäger, Regierungspräsidium Stuttgart, Kerstin Bach, Regierungspräsidium Karlsruhe, Cornelie Haag, Regierungspräsidium Tübingen, and supplemented by Bodo Krauß, Ministerium für ländlichen Raum und Verbraucherschutz Baden-Württemberg (Baden-Württemberg state ministry for rural areas and consumer protection), Ref. 62); Bavaria (Bernd-Ulrich Rudolph, Bayerisches Landesamt für Umwelt, (Bavarian state office for the environment) Burkard Pfeiffer and Matthias Hammer, Koordinationsstelle für Fledermausschutz Nordbayern (Northern Bavarian coordination office for bat conservation), Dr. Andreas Zahn, Koordinationsstelle für Fledermausschutz Südbayern (Southern Bavarian coordination office for bat conservation), with collaboration by Rudolf Leitl, Kathrin Weber & Angelika Meschede); Berlin (Johannes Schwarz, Berlin Senate Department for Urban Development and the Environment); Brandenburg (J. Teubner & J. Teubner, Zippelsförde Nature Conservation Station (with collaboration by Dr. D. Dolch); Bremen (Henrich Klugkist, Senat für Umwelt, Bau und Verkehr (with the Senator for the environment, building and transport)); Hamburg (Günter Schäfers, Behörde für Stadtentwicklung und Umwelt (Office for urban development and the environment), with supporting contributions by H. Reimers, UIN Pinneberg); Hesse (Susanne Jokisch, Hessen-Forst FENA (the FENA service centre for forest management and nature conservation, sited within Hessen-Forst, the forestry arm of the Hesse state administration)), with contributions by Dr. Markus Dietz, Karl Kugelschafter, Stephan Zaenker, Joseph Köttnitz); Mecklenburg – Western Pomerania (Angelika Fuß, Juliane Wendt & Kristin Zscheile, Landesamt für Umwelt, Naturschutz und Geologie (state office for the environment, nature conservation and geology)); Lower Saxony (Mungla Sieck & Bärbel Pott-Dörfer, Niedersächsischer Landesbetrieb für Wasserwirtschaft, Küsten- und Naturschutz (Lower Saxony state office for water resources management, coastal protection and nature conservation)); North Rhine – Westphalia (Dietlind Geiger-Roswora, Landesamt für Natur, Umwelt und Verbraucherschutz (State office for nature, the environment and consumer protection)); Saarland (Dr. Christine Harbusch, NABU (German Nature and Biodiversity Conservation Union), Dirk Gerber, Landesamt für Umwelt- und Arbeitsschutz (state office for environmental protection and occupational safety)); Saxony (Sächsisches

Staatsministerium für Umwelt und Landwirtschaft (Saxony state ministry for the environment and agriculture), with contributions of Sächsisches Staatsministerium für Soziales und Verbraucherschutz (Saxony state ministry for social affairs and consumer protection), Sächsisches Staatsministerium für Wirtschaft, Arbeit und Verkehr (Saxony state ministry for economics, labour and transport), Sächsisches Landesamt für Umwelt, Landwirtschaft und Geologie (state office for the environment, agriculture and geology), Staatsbetrieb Sachsenforst (forestry authority of Saxony) and the Landesdirektion Sachsen administrative authority; Saxony-Anhalt (Dr. Martin Trost, Landesamt für Umweltschutz (state office for environmental protection), with contributions of the Landesverwaltungsamt Sachsen-Anhalt (state administrative office), Landesreferenzstelle Fledermausschutz Sachsen-Anhalt (state reference point for bat conservation) and Arbeitskreis Fledermäuse Sachsen-Anhalt e.V. (working group for bat conservation)); Thuringia (Hartmut Geiger, Thüringer Landesanstalt für Umwelt und Geologie (state office for the environment and geology), the coordinating office for bat conservation in Thuringia) and information/research of our own.

B. Germany's bats

1. Summary of information about species occurring in Germany

In the 2013 National Report pursuant to the Habitats (FFH) Directive (the 2007-2012 report period), 23 of the 24 bat species occurring in Germany were assessed (cf. Tab. 1). Few data are available for Savi's pipistrelle (*Hypsugo savii*). Migration of this species into Bavaria may be presumed, in light of increasing numbers of relevant sightings. Since 2010, calls have been recorded in 10 different hunting habitats, and on 23 September 2011, a subadult bat was found in Rosenheim. On 23 May 2011, an individual of the Schreiber's bent-wing bat (*Miniopterus schreibersii*), which since 1958 had been considered extinct or disappeared in Germany, was found by chance in a maternity roost of mouse-eared bats in Ettenheim (Baden-Württemberg)[1]. Possibly, the individual in question was a visitor from the southern Alsace region. Only two of the conservation-status assessments that have changed with respect to the last National Report pursuant to the Habitats (FFH) Directive are the result of actual changes. The changes in question include a worsening of the conservation status of the serotine bat and of Nathusius' bat in the continental biogeographic region. The other changes are primarily the result of improvements in the available data or of use of a different method.

Table 1: Assessment of the conservation status of bat species in Germany, as set forth in the 2013 National Report pursuant to the Habitats (FFH) Directive. KON = Continental biogeographic region; ATL = Atlantic biogeographic region; ALP = Alpine biogeographic region. Conservation status: FV = favourable; U1 = unfavourable-inadequate; U2 = unfavourable-bad); XX = unknown. White = does not occur in the region.

Assessment of conservation status				
Scientific name	**Common name**	**KON**	**ATL**	**ALP**
Barbastella barbastellus	Barbastelle (bat)	U1	U2	FV
Eptesicus nilssonii	Northern bat	U1	XX	FV
Eptesicus serotinus	Serotine bat	U1	U1	XX
Myotis alcathoe	Alcathoe's bat	XX	XX	
Myotis bechsteinii	Bechstein's bat	U1	U2	XX
Myotis brandtii	Brandt's bat	U1	U1	XX
Myotis dasycneme	Pond bat	U1	U1	
Myotis daubentonii	Daubenton's bat	FV	FV	FV
Myotis emarginatus	Geoffroy's bat	U1	U2	XX
Myotis myotis	Greater mouse-eared bat	FV	U1	FV
Myotis mystacinus	Whiskered bat	FV	U1	FV
Myotis nattereri	Natterer's bat	FV	FV	FV
Nyctalus leisleri	Leisler's bat	U1	U1	XX
Nyctalus noctula	Common noctule	U1	FV	XX
Pipistrellus kuhlii	Kuhl's pipistrelle	FV		
Pipistrellus nathusii	Nathusius' bat	U1	FV	XX
Pipistrellus pipistrellus	Pipistrelle bat	FV	FV	FV
Pipistrellus pygmaeus	Soprano pipistrelle	U1	XX	XX
Plecotus auritus	Brown long-eared bat	FV	FV	FV
Plecotus austriacus	Grey long-eared bat	U1	U1	
Rhinolophus ferrumequinum	Greater horseshoe bat	U2		
Rhinolophus hipposideros	Lesser horseshoe bat	U2		U2
Vespertilio murinus	Parti-coloured bat	XX	XX	XX

[1] Hensle, E. (2011): Ein seltener Gast. - Der Flattermann – Mitteilungen der Arbeitsgemeinschaft Fledermausschutz Baden-Württemberg e.V., No. 23, p. 47.

In the 2013 National Report, the ranges of most bat species were classified as favourable (cf. Tab. 2). Combined current occurrence and range maps have been attached to the present report.

Table 2: Assessment of the ranges of bat species in Germany, as set forth in the 2013 National Report pursuant to the Habitats (FFH) Directive. KON = Continental biogeographic region; ATL = Atlantic biogeographic region; ALP = Alpine biogeographic region. Range: FV = favourable; U1 = unfavourable-inadequate; U2 = unfavourable-bad); XX = unknown. White = does not occur in the region.

Assessment of ranges in the biogeographic regions				
Scientific name	**Common name**	**KON**	**ATL**	**ALP**
Barbastella barbastellus	Barbastelle (bat)	FV	XX	FV
Eptesicus nilssonii	Northern bat	FV	XX	FV
Eptesicus serotinus	Serotine bat	FV	U1	XX
Myotis alcathoe	Alcathoe's bat	XX	XX	
Myotis bechsteinii	Bechstein's bat	FV	XX	XX
Myotis brandtii	Brandt's bat	FV	FV	XX
Myotis dasycneme	Pond bat	U1	FV	
Myotis daubentonii	Daubenton's bat	FV	FV	FV
Myotis emarginatus	Geoffroy's bat	FV	FV	FV
Myotis myotis	Greater mouse-eared bat	FV	FV	FV
Myotis mystacinus	Whiskered bat	FV	U1	FV
Myotis nattereri	Natterer's bat	FV	FV	FV
Nyctalus leisleri	Leisler's bat	FV	U1	XX
Nyctalus noctula	Common noctule	FV	FV	FV
Pipistrellus kuhlii	Kuhl's pipistrelle	FV		
Pipistrellus nathusii	Nathusius' bat	FV	FV	FV
Pipistrellus pipistrellus	Pipistrelle bat	FV	FV	FV
Pipistrellus pygmaeus	Soprano pipistrelle	FV	XX	XX
Plecotus auritus	Brown long-eared bat	FV	FV	FV
Plecotus austriacus	Grey long-eared bat	FV	FV	
Rhinolophus ferrumequinum	Greater horseshoe bat	U2		
Rhinolophus hipposideros	Lesser horseshoe bat	U2		U2
Vespertilio murinus	Parti-coloured bat	FV	FV	FV

2. General population situation and trends

2.1 Population developments

The 2013 National Report pursuant to the Habitats (FFH) Directive also includes assessments of bat-population status and the prospects for the various relevant species. The results are presented in an overview in Tables 3 and 4.

Table 3: Assessment of the populations of bat species in Germany, as set forth in the 2013 National Report pursuant to the Habitats (FFH) Directive. KON = Continental biogeographic region; ATL = Atlantic biogeographic region; ALP = Alpine biogeographic region. Population: FV = favourable; U1 = unfavourable-inadequate; U2 = unfavourable-bad); XX = unknown. White = does not occur in the region.

Assessment of populations in the biogeographic regions				
Scientific name	**Common name**	**KON**	**ATL**	**ALP**
Barbastella barbastellus	Barbastelle (bat)	U1	U2	XX
Eptesicus nilssonii	Northern bat	U1	XX	XX
Eptesicus serotinus	Serotine bat	U1	U1	XX
Myotis alcathoe	Alcathoe's bat	XX	XX	
Myotis bechsteinii	Bechstein's bat	U1	U2	XX
Myotis brandtii	Brandt's bat	U1	U1	XX
Myotis dasycneme	Pond bat	U1	U1	
Myotis daubentonii	Daubenton's bat	FV	FV	FV
Myotis emarginatus	Geoffroy's bat	U1	U2	XX
Myotis myotis	Greater mouse-eared bat	FV	U1	FV
Myotis mystacinus	Whiskered bat	FV	FV	FV
Myotis nattereri	Natterer's bat	FV	FV	XX
Nyctalus leisleri	Leisler's bat	U1	U1	XX
Nyctalus noctula	Common noctule	U1	FV	XX
Pipistrellus kuhlii	Kuhl's pipistrelle	FV		
Pipistrellus nathusii	Nathusius' bat	FV	FV	XX
Pipistrellus pipistrellus	Pipistrelle bat	FV	FV	FV
Pipistrellus pygmaeus	Soprano pipistrelle	U1	XX	XX
Plecotus auritus	Brown long-eared bat	FV	FV	XX
Plecotus austriacus	Grey long-eared bat	U1	U1	
Rhinolophus ferrumequinum	Greater horseshoe bat	U2		
Rhinolophus hipposideros	Lesser horseshoe bat	U1		U2
Vespertilio murinus	Parti-coloured bat	XX	XX	XX

Table 4: Assessment of the prospects for bat species in Germany, as set forth in the 2013 National Report pursuant to the Habitats (FFH) Directive. KON = Continental biogeographic region; ATL = Atlantic biogeographic region; ALP = Alpine biogeographic region. Prospects: FV = favourable; U1 = unfavourable-inadequate; U2 = unfavourable-bad); XX = unknown. White = does not occur in the region.

Assessment of prospects in the biogeographic regions				
Scientific name	**Common name**	**KON**	**ATL**	**ALP**
Barbastella barbastellus	Barbastelle (bat)	U1	U2	FV
Eptesicus nilssonii	Northern bat	U1	XX	FV
Eptesicus serotinus	Serotine bat	U1	U1	XX
Myotis alcathoe	Alcathoe's bat	XX	XX	
Myotis bechsteinii	Bechstein's bat	U1	U1	XX
Myotis brandtii	Brandt's bat	U1	U1	XX
Myotis dasycneme	Pond bat	U1	FV	
Myotis daubentonii	Daubenton's bat	FV	FV	FV
Myotis emarginatus	Geoffroy's bat	U1	U2	XX
Myotis myotis	Greater mouse-eared bat	FV	U1	FV
Myotis mystacinus	Whiskered bat	FV	XX	FV
Myotis nattereri	Natterer's bat	FV	FV	FV
Nyctalus leisleri	Leisler's bat	U1	XX	XX
Nyctalus noctula	Common noctule	U1	FV	FV
Pipistrellus kuhlii	Kuhl's pipistrelle	FV		
Pipistrellus nathusii	Nathusius' bat	U1	FV	FV
Pipistrellus pipistrellus	Pipistrelle bat	FV	FV	FV
Pipistrellus pygmaeus	Soprano pipistrelle	U1	XX	XX
Plecotus auritus	Brown long-eared bat	FV	FV	FV
Plecotus austriacus	Grey long-eared bat	U1	XX	
Rhinolophus ferrumequinum	Greater horseshoe bat	U2		
Rhinolophus hipposideros	Lesser horseshoe bat	U1		U1
Vespertilio murinus	Parti-coloured bat	XX	XX	FV

The overall trends, as determined on the basis of the various assessed parameters, are shown in Table 5.

Table 5: Assessment of the overall trends for bat species in Germany, as set forth in the 2013 National Report pursuant to the Habitats (FFH) Directive. KON = Continental biogeographic region; ATL = Atlantic biogeographic region; ALP = Alpine biogeographic region. "=" = stable, "?" = unknown, "-" = worsening trend, "+" = improving trend, white = does not occur in the region.

Overall trends in the biogeographic regions				
Scientific name	**Common name**	**KON**	**ATL**	**ALP**
Barbastella barbastellus	Barbastelle (bat)	=	=	=
Eptesicus nilssonii	Northern bat	?	?	=
Eptesicus serotinus	Serotine bat	-	-	?
Myotis alcathoe	Alcathoe's bat	?	?	
Myotis bechsteinii	Bechstein's bat	-	+	?
Myotis brandtii	Brandt's bat	?	=	?
Myotis dasycneme	Pond bat	=	?	
Myotis daubentonii	Daubenton's bat	=	=	=
Myotis emarginatus	Geoffroy's bat	-	=	?
Myotis myotis	Greater mouse-eared bat	=	+	=
Myotis mystacinus	Whiskered bat	=	+	=
Myotis nattereri	Natterer's bat	=	=	=
Nyctalus leisleri	Leisler's bat	-	?	?
Nyctalus noctula	Common noctule	-	=	?
Pipistrellus kuhlii	Kuhl's pipistrelle	+		
Pipistrellus nathusii	Nathusius' bat	=	=	?
Pipistrellus pipistrellus	Pipistrelle bat	=	=	=
Pipistrellus pygmaeus	Soprano pipistrelle	=	?	?
Plecotus auritus	Brown long-eared bat	=	=	=
Plecotus austriacus	Grey long-eared bat	-	=	
Rhinolophus ferrumequinum	Greater horseshoe bat	+		
Rhinolophus hipposideros	Lesser horseshoe bat	+		+
Vespertilio murinus	Parti-coloured bat	?	?	?

2.2 Red List

No new national Red List of Germany's bats was published during the period covered by the report. The Red List of 2009[2] remains valid. The classifications it contains were described in the previous National Report in the framework of the EUROBATS agreement.

[2] Meinig, H., Boye, P. & Hutterer, R. (2009): Rote Liste und Gesamtartenliste der Säugetiere (Mammalia) Deutschlands. – Naturschutz und Biologische Vielfalt, H. 70, 115-153.

3. Habitats and roosts

The habitats of the various bat species were assessed in the 2013 National Report pursuant to the Habitats (FFH) Directive. The results are presented in Table 6.

Table 6: Assessment of the habitats of bat species in Germany, as set forth in the 2013 National Report pursuant to the Habitats (FFH) Directive. KON = Continental biogeographic region; ATL = Atlantic biogeographic region; ALP = Alpine biogeographic region. Habitat: FV = favourable; U1 = unfavourable-inadequate; U2 = unfavourable-bad); XX = unknown. White = does not occur in the region.

Assessment of habitats in the biogeographic regions				
Scientific name	**Common name**	**KON**	**ATL**	**ALP**
Barbastella barbastellus	Barbastelle (bat)	U1	U1	FV
Eptesicus nilssonii	Northern bat	U1	XX	FV
Eptesicus serotinus	Serotine bat	U1	U1	XX
Myotis alcathoe	Alcathoe's bat	XX	XX	
Myotis bechsteinii	Bechstein's bat	U1	U1	XX
Myotis brandtii	Brandt's bat	U1	U1	XX
Myotis dasycneme	Pond bat	U1	U1	
Myotis daubentonii	Daubenton's bat	FV	FV	XX
Myotis emarginatus	Geoffroy's bat	U1	U1	XX
Myotis myotis	Greater mouse-eared bat	FV	U1	FV
Myotis mystacinus	Whiskered bat	FV	FV	FV
Myotis nattereri	Natterer's bat	FV	FV	FV
Nyctalus leisleri	Leisler's bat	U1	XX	FV
Nyctalus noctula	Common noctule	U1	XX	XX
Pipistrellus kuhlii	Kuhl's pipistrelle	FV		
Pipistrellus nathusii	Nathusius' bat	FV	FV	XX
Pipistrellus pipistrellus	Pipistrelle bat	FV	XX	FV
Pipistrellus pygmaeus	Soprano pipistrelle	U1	XX	XX
Plecotus auritus	Brown long-eared bat	FV	FV	FV
Plecotus austriacus	Grey long-eared bat	U1	U1	
Rhinolophus ferrumequinum	Greater horseshoe bat	U2		
Rhinolophus hipposideros	Lesser horseshoe bat	U2		U1
Vespertilio murinus	Parti-coloured bat	XX	XX	XX

3.1 Roosts

The following section describes, by way of example, a number of bat roost sites, in various Länder.

Bavaria: Roosts in buildings – renovation: Many examples can be cited in which bat-colony roosts in or on buildings have been renovated in accordance with requirements of nature conservation authorities and under the expert supervision of coordination offices for bat conservation. Such measures have primarily affected maternity roosts of mouse-eared bats, although measures have also been carried out in roosts of Geoffroy's bat, Brandt's bat, the lesser horseshoe bat, the northern bat (facade roosts), the noctule bat (facades), the serotine bat and the grey long-eared bat, as well as in historic buildings (winter roosts). In the latter, problems occur especially when cracks are sealed.

Such renovation, and the success of relevant efforts at protection, are described in the annual reports of the coordination offices for bat conservation. The relevant findings to date were assessed in the framework of an Interreg project carried out in 2007. In cooperation with the Austrian coordination

office for bat conservation, a renovation guide has been prepared that sets forth what is known about the various bat species and that provides specific recommendations related to renovation.

A positive example: Würzburg district, Holzkirchhausen, St. Aegidius Catholic church, maternity roost of the greater mouse-eared bat (FFH-species roost): The renovation began in late summer 2011 and was completed in spring 2012. The requirements relative to bat conservation were observed. In summer 2012, a total of some 600 bats were counted in the maternity roost. While that number was lower than the counts made in previous years, the results of the renovation must be considered positive with respect to the bats.

Saxony: Three new maternity roosts of the lesser horseshoe bat (*Rh. hipposideros*) were found in the Sächsische Schweiz-Osterzgebirge district, when bats were captured at underground roosts, and fitted with transmitters, in connection with planning for provision of roost options in the general habitat.
A maternity roost of Nathusius' bat has been found in Boxberg (Neuliebel).

North Rhine – Westphalia: Maternity roost of mouse-eared bats in Eitorf (Rhein-Sieg district): In 2009, a maternity colony of mouse-eared bats, with about 175 females, was discovered in a multi-family residential building located in the center of the town of Eitorf. The colony was sited in narrow spaces between the building's roof tiles and roof insulation. In early 2011, a loft apartment in the building was converted into a suitable roost area for the colony. The conversion was sponsored by the state (North-Rhine – Westphalia (NRW)) section of the German Nature and Biodiversity Conservation Union (NABU), with financial support from the foundation NRW-Stiftung. The NRW section of the German Nature and biodiverityConservation Union has rented the apartment for this purpose for an initial period of 5 years. The converted apartment was immediately accepted by the maternity colony.

Thuringia: Measures to protect the largest German winter roost of the lesser horseshoe bat, located in Kaolinstollen Altendorf, a decommissioned kaolin mine: The winter roost had not been properly secured, and after it was disturbed by geocachers, its population declined significantly. After a range of options for protecting the roost proved unfeasible (cf. under 4), the foundation Stiftung Fledermaus provided emergency protection for it. Since then, its population has recovered back to its normal levels.

3.2 Hunting biotopes

During the period covered by the report, studies of hunting areas and habitats, and of the ways they were being used by bats, were carried out in several Länder. These included the following:

Bavaria:
Lustig A. & B.-U. Rudolph (2011): Telemetric study in the framework of a project sponsored by the "GlücksSpirale" lottery organization, "Identification and protection of bat roosts in the city of Augsburg" ("Ermittlung und Schutz von Fledermausquartieren in der Stadt Augsburg"). Unpublished project report prepared under commission to the Augsburg section of the Bavarian bird-conservation society Landesbund für Vogelschutz (LBV).

Anika Lustig (2010): Quartiernutzung und Jagdhabitatswahl der Großen Bartfledermaus Myotis brandtii (Eversmann, 1845) in Bayern ("Roost use and hunting-habitat selection by Brandt's bat (Myotis brandtii) (Eversmann, 1845) in Bavaria"). Diplomarbeit (diploma thesis) at LMU Munich university.

In Hesse, some forestry offices have been assuming sponsorships for the barbastelle.

Saxony: In 2013, telemetric studies were carried out in a special study area, with a view to adding to knowledge about summer roosts and hunting biotopes of grey long-eared bats in Saxony.[3]

[3] Schmidt, C. & Bellstedt, T. (2013a): Begleitende regionale Untersuchungen im Zusammenhang mit Natura 2000 in Bezug auf Arten gemäß Anhang II und IV FFH-RL (Fledermäuse). Work commissioned by the Saxony state office for the environment, agriculture and geology (LfULG), Kamenz branch, 34 pp.

Berlin: In 2013, Anna Dziallas completed the following bachelor's degree thesis: Untersuchung von Fledermäusen in den Wäldern Berlin-Köpenicks – Eine frühsommerliche Erfassung der Fledermausfauna in den Forstrevieren Rahnsdorf, Müggelsee und Friedrichshagen mittels Batcordern (Hochschule für Nachhaltige Entwicklung Eberswalde, FH) ("Study of bats in the forests of the Berlin-Köpenick area – an early-summer survey of bat fauna in the forest districts of Rahnsdorf, Müggelsee and Friedrichshagen, using batcorders (Eberswalde University (of Applied Sciences) for Sustainable Development)").

4. Threats

The 2013 National Report pursuant to the Habitats (FFH) Directive lists numerous threat factors, and weights them in terms of their significance. Of factors with impacts considered to be especially grave, it lists the following as the most common (in alphabetical order):

- Logging without any reforestation or natural rejuvenation (deforestation)
- Demolition or destruction of buildings and settlement structures
- Changes in types/intensity of utilisation
- Anthropogenic reduction of habitat interconnections; habitat fragmentation
- Tree maintenance, felling of trees for reasons of traffic safety
- Removal of hedges and patches of woodland
- Removal of old and dead wood
- Use of biocides, hormones and chemicals (agriculture)
- Logging, clear-cutting
- Land consolidation in agricultural areas
- Forest-management measures
- Wind-energy production
- Rock-climbing, mountain climbing, caving
- Intensification of agricultural use
- Renovation and restoration of buildings
- Road and “Autobahn” construction

In sum, the key factors affecting the conservation status of bats in Germany include roost loss (for example, via building renovations and modernisations (e.g. for energy efficiency) or forest-management measures (see above)); habitat changes (via such factors as agriculture and silviculture, land consolidation and tree maintenance (see above), whose impacts include effects on the availability of food); and direct impacts (traffic infrastructure, disturbances, operation of wind turbines).

An example from Thuringia, illustrating the threats posed by geocachers:
In 2011, a geocache was placed in the decommissioned kaolin mine Kaolinstollen Altendorf. Over the next 1.5 years, it was logged about 200 times. In other words, geocachers entered the roost every other day, on average. An announcement at www.geocaching.com to the effect that the site was closed during the winter had no effect, which was not surprising, given the location's attractiveness. Because the mine system was abandoned, it proved difficult to find legally conformal ways of removing the cache and of controlling access to the system. In a plan-approval process related to a road-construction project, it was then formally decided to protect the roost. When no action was taken as a result, the local nature-conservation authority found itself without any means of providing the necessary protection. At that point, the entrance was closed provisionally by the foundation Stiftung Fledermaus (cf. 3.1). The disturbances of the roost had impacts on the population of the lesser horseshoe bat: before the cache was placed, over 700 bats had been counted; after the cache was discovered, only 330 remained. In the second winter following the closure, the population has

Schmidt, C. & Bellstedt, T. (2013b): Ergänzende Untersuchungen zum Vorkommen von Fledermäusen nach Anhang II und IV FFH-RL im FFH-Gebiet „Dubringer Moor“ (SN-Nr. 47) und den umliegenden Ortschaften Zeißholz, Neudorf (Klösterlich), Dubring, Dörgenhausen und Michalken. Final report under commission to the Saxony state office for the environment, agriculture and geology (LfULG), Kamenz branch, 50 pp.

increased again, to 730, although the lesser horseshoe bats now choose significantly different locations in which to hang.

A cursory review (GIS survey in the framework of a practical-course project carried out in 2013) of the geocaches placed around the city of Jena found caches in, or very close to, about one-third of the winter bat roosts known in the area. A similar figure has been obtained for the underground FFH sites for bat conservation in Thuringia.

Threats via wind farms:

The state ornithological centre (Staatliche Vogelschutzwarte) sited within Brandenburg's state office for the environment, health and consumer protection continues to keep records of the numbers of dead bats found at Germany's wind turbines. Table 7 shows the current relevant figures, broken down by Länder.

Tab. 7. Bat losses at wind turbines in Germany. Data provided by the central registry of finds that is maintained by the state ornithological centre (Staatliche Vogelschutzwarte) sited within Brandenburg's state office for the environment, health and consumer protection (last revision: 4 April 2014, Tobias Dürr – e-mail: tobias.duerr@lugv.brandenburg.de, Internet: http://www.lugv.brandenburg.de/cms/detail.php/bb1.c.312579.de)

Species	Länder, Germany													Total
	BB	BW	BY	HB	HE	MV	NI	NW	RP	SH	SN	ST	TH	
Nyctalus noctula	418	3	3	3		14	90	4		5	101	65	20	**726**
N. leislerii	20	17	2				8	4	10		7	28	14	**110**
Eptesicus serotinus	11	2	2				11	2		1	11	2	1	**43**
E. nilssonii			1								2			**3**
Vespertilio murinus	35	6	4		1	1	8		1		16	8	9	**89**
Myotis myotis											1	1		**2**
M. dasycneme							2			1				**3**
M. daubentonii	2					1				1		1		**5**
M. brandtii												1		**1**
M. mystacinus		2												**2**
M. brandtii/mystacinus			1											**1**
Pipistrellus pipistrellus	92	130	8			5	61	27	21	7	38	25	25	**439**
P. nathusii	217	8	20		1	16	76	1	10	11	76	80	48	**564**
P. pygmaeus	26	2				2					3	10	2	**45**
Pipistrellus spec.	11	4				10	5		1	1		4		36
Hypsugo savii												1		**1**
Barbastella barbastellus							1							**1**
Plecotus austriacus	5										1			**6**
Plecotus auritus	2					1						1	1	**5**
Chiroptera spec.	6	5	6				8		2		4	4	11	46
Total:	**845**	**179**	**47**	**3**	**2**	**50**	**270**	**38**	**45**	**27**	**260**	**231**	**131**	**2128**

BB = Brandenburg, BW = Baden-Württemberg, BY = Bavaria, HB = Hanseatic City of Bremen, HE = Hesse, MV = Mecklenburg – Western Pomerania, NI = Lower Saxony, NW = North Rhine – Westphalia, RP = Rhineland-Palatinate, SH = Schleswig-Holstein, SN = Saxony, ST = Saxony-Anhalt, TH = Thuringia

5. Data collection

Germany's national monitoring of bat species, with respect to the Habitats Directive, is described in detail in EUROBATS Publication Series No.5, "Guidelines for Surveillance and Monitoring of European Bats" (2010) (in chapter 5.3.4, "German federal surveillance and monitoring of bats under the Habitats Directive"). The relevant monitoring results are collected by the Federal Agency for Nature Conservation (BfN) and then evaluated for Germany's national report under the Habitats Directive.

The following Table 8 provides an overview of the (in some cases, additional) collection of bat data that takes place in the Länder level:

Tab. 8. Data collection at the Länder level. Last revised in 2013, on the basis of the reports submitted by the Länder.

Baden-Württemberg BW	Data are collected by the members of the **Working Group on Bat Conservation in Baden-Württemberg** (AGF) (in North Baden, they are collected by members of the **North Baden Coordination Office for Bat Conservation** (Koordinationsstelle für Fledermausschutz Nordbaden) and by volunteers of the **Working Group on Bat Conservation in North Baden AG / volunteer bat-conservation experts** (Fledermausschutz Nordbaden/ehrenamtlichen Sachverständigen im Fledermausschutz)) and centrally collected and evaluated by the **Bat Conservation Coordination Office** (Koordinationsstelle für Fledermausschutz). The **Karlsruhe Natural History Museum** maintains an additional database for scientific collection of bat evidence.
Bavaria BY	As of the end of the 2013 report period, the Bavarian bat database (Fledermaus-Datenbank Bayern) listed 27,712 find sites (up from 24,027 as of 31 December 2009) and 129,029 species sightings (up from 103,085 as of 2009). Data are collected and entered by the **Northern and Southern Bavarian Coordination Offices for Bat Conservation**. They are also collected by **volunteer bat conservationists**, and they are gathered in the framework of **commissioned studies / assessments**, of **intervention planning** (for example, in species protection assessments) and of **scientific studies**. In addition, data collected in **special studies** commmissioned by third parties also enter into the database. **State-wide bat monitoring** is carried out by the **coordination offices for bat conservation**, **under commission to the State office for the environment (LfU)**. It covers colonies of horseshoe bats, mouse-eared bats, Geoffroy's bat, Nathusius's pipistrelle and barbastelles; a selection (in some cases, random samples) of summer roosts of the noctule bat, common pipistrelle, Brandt's bat, whiskered bat and grey long-eared bat; and a selection of winter roosts under "long-term monitoring" ("Dauerbeobachtungs-Winterquartiere"). Other roosts are monitored as well, at less-frequent intervals. This monitoring programme is expanded for purposes of the report pursuant to Article 17 of the Habitats Directive. Monitoring relative to the Habitats Directive has been organised by the Northern Bavarian coordination office for bat conservation, under commission to the State office for the environment (LfU). It covers about 200 additional roosts in Bavaria. Since 2005, extensive **surveys of bats in forests** have been carried out in FFH areas. The state's forest administration, working under the technical direction of the Bavarian State institute for forests and forest management (Bayerische Landesanstalt für Wald und Forstwirtschaft – LWF), and with the support of the coordination offices for bat conservation, collects extensive data in such efforts.
Berlin BE	Population data are regularly collected in winter roosts in connection with Berlin's species-support programme for bats, **under commission to the state of Berlin's supreme nature conservation authority (Senate Administration for Urban Development)**. Bat "box" areas in forests are checked in part by **volunteer bat conservationists** (for example, members of the German Nature **and Biodiversity** Conservation **Union** (NABU)) and in part (at larger intervals) within the framework of the **species support programme**.
Brandenburg BB	Survey data are provided from the database of the **State environmental agency / Zippelsförde Nature Conservation Station**, in cooperation with the **State committee on mammalian studies (Landesfachausschuss Säugetierkunde)** of the **German Nature and Biodiverity Conservation Union (NABU)**, Brandenburg state section, and with the nature conservation station of Brandenburg's NaturSchutzfonds (Brandenburg fund).
Bremen HB	Data are collected in selected forests and parks, in the framework of the **Bremen integrated survey programme (Integriertes Erfassungsprogramm Bremen** (IEP)). In addition, special surveys have been (are) carried out in connection with **planning procedures**, especially with regard to wind farms. Furthermore, **studies have been carried out in the** Bunker Valentin winter roost, and **bat watchers** have provided **observation data**.
Hamburg HH	The state's **Office for urban development and the environment (Behörde für Stadtentwicklung und Umwelt)** the competent authority, collects bat data via the **volunteer bat watchers of Hamburg's Bat conservation working group (Arbeitsgruppe Fledermausschutz Hamburg – AGF)**, a group within the German Nature **and Biodiversity** Conservation **Union** (NABU), and the **bat conservation group of the Hamburg section of Friends of the Earth Germany (BUND).** The office also obtains data by evaluating relevant **reports** and awarding relevant work contracts. The collected data include data on species status, numbers, find sites, threats, protection measures and "other special aspects". Additional data are collected via random-sample-based monitoring relative to the Habitats Directive, and for conservation-status assessment, covering the serotine bat, brown long-eared bat, common noctule, Nathusius's pipistrelle and common pipistrelle.
Hesse HE	The pertinent data-collecting agency is the **Sachbereich Naturschutz nature conservation agency within Hessen-Forst FENA (the FENA service centre for forest management and nature conservation, sited within Hessen-Forst, the forestry arm of the Hesse state administration)** (Sachbereich Naturschutz is an important nature conservation agency in Hesse). Sachbereich

	Naturschutz regularly awards contracts for state-wide **species assessment** oriented to Hesse's bat populations, and it purchases **data obtained via surveys carried out by volunteers**. The Sachbereich Naturschutz nature conservation agency also coordinates and commissions bat monitoring throughout the state.
Lower Saxony NI	**Lower Saxony's state office for water-resources management, coastal protection and nature conservation (NLWKN)**, the competent authority, collects bat data via Lower Saxony's volunteer-based animal-species-survey programme, via evaluation of reports and via efforts that it initiates through allocation of work contracts. The collected data include data on species status, numbers, distribution spots, threats, protection measures and "other special aspects". In addition, random-sample-based monitoring relative to the Habitats Directive yields data on population status, habitats and impairments. The random-sample-monitoring data are collected in the period covered by the relevant report, via efforts commissioned in the framework of work contracts.
Mecklenburg – Western Pomerania MV	Random-sample monitoring of bat roosts is carried out in the framework of reporting obligations under the Habitats Directive. Additional surveys are carried out by the **State committee for bat conservation and bat research (Landesfachausschuss für Fledermausschutz und –forschung) within the MV chapter of the German Nature and Biodiversity Conservation Union (NABU)** and by additional **volunteer bat conservationists**.
Saarland SL	In the area of volunteer work, bat data are collected primarily by members of the bat conservation working group within the **German Nature and Biodiversity Conservation Union (NABU)** and by the **bat section of the DELATTINIA society for nature research**. The collected data are made available to the competent authority. Data are also collected in the framework of **studies relative to intervention regulation** under nature conservation law. The entities who commission such studies do not always provide the resulting raw data to state authorities, however. The bat-conservation coordination office (Koordinationsstelle Fledermausschutz) is responsible for compiling and administrating all collected data, at the Centre for biodocumentation (ZfB). A state-wide programme is in place for monitoring populations in Natura 2000 areas.
Saxony SN	Support for existing bat roosts, and exploration relative to new roosts, is carried out mainly by **volunteer bat conservationists**, under the auspices of the Saxony section of the German Nature Conservation Association (NABU), and/or the Saxony Association for bat research and conservation (Sächsischer Verband für Fledermausforschung und -schutz e. V. - SVF). Such activities are supported by nature conservation authorities and, to some extent, are integrated within official nature conservation services. Current population and threat data for selected species (greater mouse-eared bat, barbastelle bat, Bechstein's bat, lesser horseshoe bat) and for selected important bat roosts are collected in the framework of a **support system for endangered animal species, under the auspices of the State Agency for Environment and Geology (Landesamt für Umwelt und Geologie – LfUG)**. The populations in maternity roosts of the lesser horseshoe bat have been surveyed since the early 1970s. Regular checks of some roosts of mouse-eared bats and of barbastelle bats have been organised in the framework of the support system for endangered animal species. In addition, regular checks of selected winter roosts are carried out (1-2x per season). At some roosts, checks are carried out with light barriers and photo-traps. Furthermore, the Saxony state office for the environment, agriculture and geology (LfULG) has commissioned roost checks and supporting studies in the framework of fine-scale species monitoring relative to the Habitats Directive. The resulting bat data are stored in the **central species-database of the Saxony state office for the environment, agriculture and geology (LfULG)**. Local and regional nature conservation authorities have direct access to the data pool. The data are administrated with the help of the programme MultiBaseCS©, which supports decentralized data entry and cross-checking. **Further data on bat populations are collected by the German Nature and Biodiversity Conservation Union (NABU), the state committee for bat conservation (LFA Fledermausschutz) and by the Saxony association for bat research and conservation (SVF e.V.).** On the basis of bilateral agreements with partner institutions in the eastern German Länder, scientifically oriented bat banding in the five eastern German Länder is carried out in connection with the work of a bat-banding centre for those Länder. In the same framework, the **LfULG maintains a database on bat banding and refinds**.
Saxony-Anhalt ST	Data are collected with the assistance of the following institutions and organizations: • The **State office for environmental protection** (**Landesamt für Umweltschutz)** organises state-wide overviews of all bat species in all relevant FFH areas. Random-sample-based monitoring, pursuant to relevant federal and state (Land) concepts, is the responsibility of the State office for environmental protection. To date, it has been implemented only for the lesser horseshoe bat and (to some extent) for mouse-eared bats. • Saxony-Anhalt's State reference point for bat conservation (**Landesreferenzstelle für Fledermausschutz Sachsen-Anhalt)**, located in the Karstlandschaft Südharz biosphere reserve, coordinates the work of volunteer specialists, including those within relevant associations. • Support for volunteer staff, most of which are members of the **Saxony-Anhalt working group on bats (Arbeitskreis Fledermäuse Sachsen-Anhalt e. V.)**, is provided by the State reference point for bat conservation and by the state office for environmental protection. • To a lesser extent, data are also provided by **experts carrying out assessments** in the context of planning procedures. Data compilations and evaluations are prepared on a project-oriented basis by **Saxony-Anhalt's State reference point for bat conservation (Landesreferenzstelle für Fledermausschutz)** and the **state office for environmental protection (Landesamt für Umweltschutz)**.
Thuringia TH	Data on bat populations are obtained from the following sources: • Bat studies in connection with **populations subject to interventions** • **Surveys in the framework of species support programmes** commissioned by Thuringia's State institute for the environment and geology (Thüringer Landesanstalt für Umwelt und

	Geologie – TLUG) • The **volunteer monitoring programmes** carried out by the Thuringian bat interest group (Interessengemeinschaft Fledermäuse Thüringen **–** IFT) • The protection and support provided by **volunteer bat conservationists** During the period covered by the report, additional data were collected in about 100 roosts, in the framework of random-sample-based monitoring under the Habitats Directive. The resulting bat data are administrated in a joint database of the IFT and of the bat-coordination office (Fledermauskoordinierungsstelle **–** FMKOO; FMKOO is responsible for managing the database), and they are regularly entered into the state's specialised nature conservation information system (FIS-Naturschutz). In that system, the data are available to nature conservation authorities. In connection with a nature conservation report on Thuringia's bat fauna ("Fledermäuse in Thüringen" ("Bats in Thuringia"), the data have been corrected and updated. The database now contains records of about 62,000 sightings, from about 8,600 distribution spots.

C. Measures relative to implementation of Article III of the Regional agreement

6. Legal measures for protection of bats, and enforcement of such measures

The legal protection of bats stayed unchanged during the reporting period at the federal level.

Court decisions of relevance to bat conservation may be accessed in the Juris database, under the search term "Fledermaus" ("bat").

The noteworthy rulings include a decision handed down by the Halle Administrative Court Procedures Code on 24 March 2011 (4 A 46/10) to the effect that projects that present a significantly increased risk of collision-related deaths of individual bats violate the prohibition on killing set forth in Art. 44 (1) No. 1 of the Federal Nature Conservation Act (BNatSchG). The ruling is significant because it defines the relevant violations with respect to individual bats, rather than to populations, i.e. it does not make such violations contingent upon threats to a population's size or conservation status. On the other hand, it does not impose binding maximum permitted numbers of fatalities per year and system (wind turbine) at relevant locations – i.e. thresholds that would define what constitutes a significantly increased risk of collision-related deaths of individual bats.

7. Protected areas of special importance with regard to bat conservation

Annex II bat species in Germany have been reported for the following numbers of Natura 2000 areas (Tab. 9):

Tab. 9. Natura 2000 areas for Annex II bat species – numbers and total areas in hectares (source: Natura 2000-Daten (Nature 2000 data), Federal Agency for Nature Conservation (BfN), last revised in 2012).

Species	Number of Natura 2000 areas	Total sizes of the Natura 2000 areas [ha]
Greater horseshoe bat *(Rhinolophus ferrumequinum)*	24	78,211
Lesser horseshoe bat *(Rhinolophus hipposideros)*	89	122,367
Barbastelle bat *(Barbastella barbastellus)*	433	748,852
Bechstein's bat *(Myotis bechsteinii)*	534	1,010,070
Pond bat *(Myotis dasycneme)*	138	277,686
Geoffroy's bat *(Myotis emarginatus)*	47	159,550
Greater mouse-eared bat *(Myotis myotis)*	953	1,416,645

Management plans, covering objectives and measures for the protection and development of the aforementioned bat species, have now been prepared for many FFH areas.
The country's established natural forest reserves, nature conservation areas, national parks and other protected areas also play a role in bat conservation.

8. Consideration of habitats that are important bat biotopes

Many habitats that are important for bats are specially protected under state nature conservation laws (cf. Germany's previous national reports for EUROBATS).

In some cases, bats are seen as a protection target (for example, in Saxony) or as an ecological asset (via certain prohibitions, for example, such as restrictions on cutting of hollow-bearing trees in Baden-Württemberg) in connection with the setting aside of nature conservation areas.

Bat species and their habitats are to be taken into account in impact mitigation and management, and in the preparation of environmental impact assessments (EIA) and supporting landscape management plans (Landschaftspflegerische Begleitpläne – LBP). In relevant individual cases, such as major projects, the state reference point/centre for bat conservation provides expert support. This is the case in Saxony-Anhalt, for example.

In 2013, North Rhine – Westphalia published a guide to the "effectiveness of species conservation measures" that is designed to provide planners of projects involving interventions, or of projects

subject to construction laws, with a reliable common framework for implementing Art. 44 (5) Federal Nature Conservation Act (BNatSchG) (inclusion of early compensation measures in review relative to species conservation). Covering a total of 12 bat species, it focuses on protecting reproduction and resting sites in connection with interventions, taking account of important feeding habitats, hunting areas, flight routes and migration corridors.

9. Measures to raise public awareness about bat conservation

Most of Germany's Länder now have successful campaigns underway to honor citizens who protect bat roosts on/in their homes and tolerate their inhabitants, as well as persons who create new bat-roost sites. Such campaigns, which are often launched at the initiative of nature conservation associations, have names such as "bat-friendliness campaign" ("Aktion Fledermausfreundlich" – Thuringia), "bat-friendly house campaign" ("Aktion Fledermausfreundliches Haus – (Mecklenburg – Western Pomerania, North Rhine – Westphalia, Hesse), "We're giving bats a home" ("Wir geben der Fledermaus ein Haus" – (Brandenburg), "Come in, bat – we're looking for homes for Baden-Württemberg nightowls" ("Fledermaus komm ins Haus – Quartiere für baden-württembergische Nachtschwärmer gesucht!" – (Baden-Württemberg) and "Welcome, bats" ("Fledermäuse willkommen" – Bavaria).

Special efforts to raise public awareness were carried out in the "Year of the Bat" campaign held in 2011/2012 (cf. Chap. 15.15).

The additional measures listed in Table 10 have been reported by the Länder – in some cases, with references to the previous report – for the period covered by the report:

Tab. 10. Measures to raise public awareness about bat conservation, 2010-2013

	BW	BY	BE	BB	HB	HH	HE	MV	NI	NW	SL	SN	ST	TH
Seminars / workshops / training courses / conferences	x	x		x				x	x	x		x	x	x
Lectures/presentations	x	x		x				x						
Excursions / guided tours	x	x			x	x	x					x	x	
Discussion events														
Informational material /brochures	x	x				x		x	x	x		x	x	x
Exhibitions	x	x		x										
Posters		x							x					
Nature trails with a special focus on bats, or similar	x							x						
Bat festivals			x				x							x
Events in the context of the European Bat Night	x	x		x	x	x	x	x		x		x	x	x
Bat projects in schools / kindergartens	x	x											x	x
Press articles / discussions	x									x	x			
TV / radio reports														
Publications											x			

Newsletters		x												x
Information systems	x									x				
Campaigns to create / protect bat roosts in and on buildings	x	x	x	x			x	x		x	x	x		x
Bat conservation foundation														x
Other events aimed at raising public awareness	x	x			x									x
BW = Baden-Württemberg, BY = Bavaria, BE = Berlin, BB = Brandenburg, HB = Hanseatic City of Bremen, HH = Hanseatic City of Hamburg, HE = Hesse, MV = Mecklenburg – Western Pomerania, NI = Lower Saxony, NW = North Rhine – Westphalia, SL = Saarland, SN = Saxony, ST = Saxony-Anhalt, TH = Thuringia.														

10. The body pursuant to Article III.5 of the Agreement

During the report period, the body of experts appointed by the Federal Government and the Länder, pursuant to Article III.5 of the Agreement, met on 28 October 2010 in Erfurt, on 2 March 2011 in Berlin and on 9 May 2012 in Bonn. Initially, during the period covered by the report, Bernd-Ulrich Rudolph served as the provisional chairman. In 2012, Hartmut Geiger was then elected as the new chairman. During the period covered by the report, the body of experts proposed criteria for identifying the nationally significant overground bat roosts pursuant to Resolution 5.7 of the Agreement and conducted a pertinent survey of the Länder. In addition, the body of experts proposed that a contract be awarded for comparison of the forest-development concepts of the Länder (cf. Chap. 15.4).

11. Additional measures for protection of bats

A Federal Programme on Biological Diversity (Bundesprogramm zur biologischen Vielfalt - http://www.biologischevielfalt.de/bundesprogramm.html) was established to support the implementation of the German National Strategy on Biological Diversity in 2011, offering funding possibilities for species with a special responsibility of Germany, because major parts of the population live here. Under the species concerned are the following two bat species, Barbastella barbastellus and Myotis bechsteinii.
In the German Länder the following projects merit attention:
The major nature conservation project "Bat habitats in the eastern volcanic Eifel landscape" ("Fledermaushabitate in der östlichen Vulkaneifel") – Mayener Grubenfeld.
From 2007 to 2013, in the Mayener Grubenfeld area, a bat habitat of European importance with reliable sightings of 16 different bat species, including five species listed in Annex II of the Habitats Directive (greater mouse-eared bat, barbastelle, pond bat, Bechstein's bat and Geoffroy's bat), the Rhineland-Palatinate section of the German Nature and Biodiversity Conservation Union (NABU), supported by the Federal Agency for Nature Conservation (BfN) with funding from the Federal Environment Ministry totaling EUR 5.3 million, carried out a major nature conservation project to protect and optimize the habitat. The area, which covers only about 30 ha, consists of old rock quarries and numerous tunnels in which basalt was quarried over a period of centuries – primarily for millstones. It serves as an important winter roost, attracting 30,000-50,000 bats from distances of up to 300 km. In addition, it is also a swarming site to which, in the late summer and fall, countless bats pay short nighttime visits in order to explore the tunnels and find mates. Prior to the project, the tunnels were in danger of collapsing and urgently needed to be secured. Following detailed surveying of the area, and with the aim of providing long-term protection for the bat populations, and their habitats and hunting areas, dangerously weak supports were stabilised, unstable ceiling sections were anchored, the entrance areas were covered with grids and also stabilised and – where necessary – dangerous tunnel collapses that had reached the surface were covered over. In addition, a concept for ecologically compatible tourism was developed that balances nature conservation aspects with

interests in touristic use of the culturally and historically significant Mayener Grubenfeld area. Thematically, the concept relies extensively on the long history of interactions between mining and bat ecology. Live video transmission of the bats' activities in the tunnels illustrate the tunnels' key importance as habitats, and eliminate any need for mine tours that could disturb or endanger the bats. A bat trail with 15 information boards leads visitors through the area and offers views of the protected area.

The Länder have listed the following additional measures for the period covered by the report:

Baden-Württemberg

- Preparation of a flyer on the topic of church renovations and species protection in the Tübingen administrative district, with supporting public-awareness measures and optimisation of procedures relative to renovations in churches with bat roosts. This effort has been able to prevent numerous planned interventions and disruptions. In some cases, it proved possible to optimise existing roosts.
- Research project: "Importance of Schreiberhöhle cave for bats" ("Bedeutung der Schreiberhöhle für Fledermäuse"), and the nature conservation area "Wental with side valleys and Feldinsel Klösterle" ("Wental mit Seitentälern und Feldinsel Klösterle" in the Heidenheim district.
- Renovation of churches and castles, with the participation of the Stuttgart regional council (Regierungspräsidium) in relevant planning, construction and co-financing.
- In a sub-project in the framework of the LIFE+ project "LIFE around the Heckgäu area" ("LIFE rund ums Heckengäu") of the Böblingen district, the nature conservation foundation Stiftung Naturschutzfonds Baden-Württemberg is carrying out multi-year surveys of bats, especially of the species greater mouse-eared bat and Bechstein's bat, in the Schönbuch FFH area and nature park. This work is improving knowledge about bat populations in the Schönbuch area and will help enhance protection for various bat species in the area.

Bavaria

In the framework of Bavaria's species support programme for bats, the Bavarian state office for the environment has awarded contracts for the following work:

- Surveys of the bats that emerge from the winter roosts "Galgenberghöhle" (near Hohenburg) and "Geisloch" (near Viehhofen) (Kugelschafter, K., 2010)
- Qualitative and quantitative surveys of overwintering bats, using light barriers and photo-traps, at the "Angerlloch" cave in the Garmisch-Partenkirchen district – feasibility study – (Kugelschafter, K., 2011)
- Review of colonies of the bat species *Plecotus austriacus* and *Eptesicus serotinus* in four areas of southern Bavaria – (Hildenbrand, R. et. al., 2012, Morgenroth, S., 2012, Gässler, S. et. al., 2012)
- Checks of bat boxes in the Schnaittenbach area, 2013 – (Leitl, R., 2013)
- Measures to protect the lesser horseshoe bat – interim report – (Gässler, S. et. al., 2013)
- Distribution of Alcathoe's bat in Bavaria – interim report, 2013 – (Pfeiffer, B., 2013).

Various local and higher nature conservation authorities, and the two national parks, award contracts for relevant work and/or carry out research (for example, the Bayerischer Wald National Park). Such work produces publications, including regional surveys of bats, such as that produced by Schürmann & Strätz (2010)[4].

The nature conservation associations Landesbund für Vogelschutz (Bavarian bird-conservation society – LBV) and Bund Naturschutz in Bayern (BN), as well as – to some extent – the state's landscape-conservation associations, continue to play exemplary roles in bat conservation. On an

[4] Schürmann & Strätz (2010). Fledermäuse im Landkreis Wunsiedel im Fichtelgebirge – Geschichte, Vorkommen, Bestand, Schutz- und Hilfsmaßnahmen. Published by the Lkr. Wunsiedel (Wunsiedel district) (http://www.landkreis-wunsiedel.de/landratsamt/natur-und-landschaft/naturschutz/fledermaeuse-im-fichtelgebirge).

annual basis, this commitment is able to generate non-profit projects in the "GlücksSpirale" lottery framework. In 2011, for example, a twin project was carried out in Augsburg that was entitled "Augsburg looks for bats" ("Augsburg sucht die Fledermaus") (the City of Augsburg and Augsburg district sections of the LPV). Since 2012, the LBV has been carrying out the LIFE project "greater horseshoe bat" ("Große Hufeisennase") in the Upper Palatinate (Oberpfalz) area (http://www.lbv.de/unsere-arbeit/life-natur-projekte/life-projekt-hufeisennase.html).

In the period covered by the report, a number of research projects were carried out in connection with diploma (Diplom), bachelor's, master's and state-examination (Staatsexamen) theses, and with doctoral dissertations, at the universities of Würzburg, Erlangen-Nuremberg and Munich (TU and LMU).

A doctoral dissertation at the University of Erlangen-Nuremberg led to the following publication in 2013: Pfeiffer, B. & Mayer, F. (2013): Spermatogenesis, sperm storage and reproductive timing in bats. Journal of Zoology, 289, 77-85.

Berlin

On a decommissioned military training area in the FFH area Wilhelmshagen-Woltersdorfer Dünenzug (area number 3548-302), 10 former vehicle housing facilities were equipped with hiding places for bats, secured against entry and covered with earth. A portion of the facility complex has a rainwater drainage system. The roosts have been accepted by bats, and the numbers of overwintering bats have been growing.

Hamburg

- Conversion of a World War II bomb shelter into a winter roost
- Management of areas with bat boxes

Mecklenburg – Western Pomerania

- Long-term, largely volunteer-run research project focusing on *Pipistrellus nathusii* and other species, in the nature park Nossentiner-/ Schwinzer Heide
- Establishment of "Fledermauszug Ostsee" ("Baltic Sea bat migration"), a volunteer-based working group, and start of research into bat migration over the Baltic Sea
- Volunteer-based monitoring of victims of collisions with wind turbines (2013)

Lower Saxony

- Restoration of maternity roosts
- Construction and optimisation of winter roosts
- Cleaning of roosts
- Efforts to combat bat mites

North Rhine – Westphalia

- Various theses as part of final work toward academic degrees (on bat populations in the Coesfeld district; studies of the Brunnen Meyer, a heavily populated winter roost) and ongoing student research projects.
- The project "Study of the sensitivity of bats hibernating in crevices to climbers on buntsandstein rocks in the Ruhr valley" ("Untersuchung der Störanfälligkeit winterschlafender Fledermäuse in Spalten durch Kletteraktivitäten an den Buntsandsteinfelsen im Rurtal") (under auspices of the Düren district), 2012
- Continuation of banding in the framework of the supporting research project "Protection of bat populations in the vicinity and surroundings of the Hambach open-pit mine" ("Bewahrung der Vorkommen von Fledermäusen im Bereich des Tagebaus Hambach und seinem Umfeld"). Since summer 2005, 1,083 bats, representing 10 different species, have been banded (including about 300 Bechstein's bats and 380 lesser noctules).

- Telemetric studies carried out from 2010 to 2013, in the framework of monitoring relative to the Habitats Directive, or in connection with projects involving interventions, in 21 areas with Bechstein's bat populations and in four barbastelle habitats, for location of maternity roosts and determination of the sizes of the pertinent colonies.
- The research project "Importance for bats of rock cliffs and caves in mountains in the Teutoburger Wald and Egge areas" ("Bedeutung der Felsklippen und Höhlen im Gebirgszug von Teutoburger Wald und Egge für Fledermäuse"). Execution: Lippe Biological Station; financed by the foundations "Stiftung für die Natur Ravensberg" and "Kurt-Lange-Stiftung" (Bielefeld)[5].

Saarland

- 2010 contract for surveys and assessment of bat populations in 2 FFH areas (forest)
- In the framework of work contracts, monitoring of populations of Annex II species pursuant to the requirements of the Habitats Directive
- 2011 contract for the project "bats in settlements" ("Siedlungsfledermäuse") (commissioned by the ZfB biodocumentation centre); the relevant work produced new sightings of roosts of the greater horseshoe bat and of Geoffroy's bat.
- In 2013, the project "Development and promotion of biocenoses with old and dead wood, via sustainable management strategies in Saarland forestry operations" ("Entwicklung und Förderung von Alt- und Totholzbiozönosen durch eine nachhaltige Bewirtschaftungsstrategie in saarländischen Forstbetrieben") was launched by the Saar section of the German Nature and Biodiversity Conservation Union (NABU), functioning as the project sponsor, with support from the Federal Agency for Nature Conservation (BfN), backed by funding of the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB), and in the framework of the federal "Biological Diversity" programme and relevant efforts of the Saarland's Ministry for the environment and consumer protection. The project is scheduled to run from 1 January 2013 - 28 December 2018. In four study areas in old forests, the project has produced sightings of (inter alia) the greater horseshoe bat, Bechstein's bat, Geoffroy's bat and greater mouse-eared bat. In addition, it has found maternity roosts of Brandt's bat and Natterer's bat.
- In 2010 and 2011, contracts were issued for surveys of bats, and study of their swarming behaviour, at the Gersheim (former) limestone mine.
- In 2011-2013, volunteers carried out regular checks of the known winter roosts.
- Advising of private persons in matters pertaining to bat conservation (renovations, found animals)

Saxony

- Checks of the success of defined measures for bat conservation
- Expert advising in individual cases of required tree-felling
- Answering of public enquiries – for example, regarding the installation of bat boxes
- Monitoring – for example, of a roost of the common noctule bat, with some 1,500 overwintering bats, in the Roman Bath of Albrechtsberg Castle in Dresden, and of a common noctule roost with about 3,000 overwintering bats, in 2012/13, in a precast-concrete-slab housing project ("Plattenbausiedlung") in Dresden-Klotzsche; determination of the winter population in the Felsendome Rabenstein area (FFH sub-area), using a photo-trap and a camera.

Thuringia

- Completion of a project supported by the environmental foundation Deutsche Bundesstiftung Umwelt (DBU) "promotion of European cooperation in bat conservation" ("Förderung der europäischen Zusammenarbeit im Fledermausschutz"): In the years 2008 through 2010, the bat-coordination office (Fledermauskoordinierungsstelle – FMKOO) carried out the project, which was

[5] Füller, M., A. Becker, A. Fölling & R. Reifenrath (2012): Die Höhlen im lippischen Eggevorland als Winterquartier für Fledermäuse. – Lippische Mitteilungen aus Geschichte und Landeskunde 81: 258-283.
Fölling, A., R. Reifenrath, A. Becker & M. Füller (2013): Zur Bedeutung der Höhlen im lippischen Eggevorland als Schwärmquartiere für Fledermäuse. – Ber. Naturwiss. Verein für Bielefeld u. Umgegend 51: 142-155.

focused on protecting the lesser horseshoe bat, and involved cooperation between Thuringia's bat conservationists and counterparts from the Czech and Slovak republics. In 2011, a workshop on the effort was held, along with a final conference entitled "experience gained in protecting lesser horseshoe bats in connecting with road planning and building demolition ("Erfahrungen beim Schutz von Hufeisennasen im Zuge von Straßenplanungen und Gebäudeabrissen"). The strong interest shown by the participants, from a total of 11 different European countries, highlights the importance of the topic involved.

- Publication of the new edition of Thüringer Landesfauna Fledermäuse (report on bats in Thuringia), as issue 27 in the series Naturschutzreport (April 2013).
- The foundation Stiftung Fledermaus was founded in 2009, and it was publicly presented for the first time in 2010, at the Donndorf cloister. Since then, it has developed well. To date, the foundation has carried out several major projects, and its office has a staff of 3. The original idea behind the foundation, of having the Stiftung Fledermaus serve as the project management agency for public bat conservation projects in Thuringia and at the federal level, is thus now well on its way to being achieved. Stiftung Fledermaus is working for the establishment of an German umbrella association for bat conservation. Currently, plans call for the association to be established in spring 2015, at the 14th national bat conference (the 2015 conference of the BAG, the national working group on bat conservation within the German Nature and Biodiversity Conservation Union(NABU)), by the Stiftung Fledermaus and cooperating partners.

12. Existing and planned programmes for bat conservation

Baden-Württemberg

Tasks of the Northern Baden coordination office for bat conservation: primarily, volunteer-based roost checks, care for injured bats, public-awareness measures and advising of members of the public; the bat conservation programme (Artenschutzprogramm Fledermäuse) carried out under commission to the Karlsruhe regional council (Regierungspräsidium):

- regular checking of important winter roosts; regular checking of bat boxes in upper-Rhine forests of importance for bat migration; systematic checking of churches and public buildings, in annually changing selections of communities, and with preparation of "church letters" describing measures for the protection/improvement/creation of bat roosts,
- analysis of guano samples collected in roosts,
- initial inspections and advising in connection with public renovation projects.

In 2013, in the Karlsruhe administrative region, telemetric studies were commissioned for the purpose of locating maternity roosts of Geoffroy's bat, which is extremely rare in the state, and of the barbastelle, which is at risk of extinction in Baden-Württemberg.

Bavaria

Since 1985, the northern and southern Bavarian coordination offices for bat conservation (two offices) have run the Bavarian bat conservation programme (cf. Zahn et al. 2012[6], Meschede & Rudolph 2004[7]).

The programme relies heavily on the assistance of volunteer bat watchers and conservationists. To help train such persons and keep their skills and knowledge up to date, the coordination offices,

[6] Zahn, A., Hammer, M. & Rudolph, B.-U. (2012): 25 Jahre erfolgreicher Fledermausschutz in Bayern. In: Fledermäuse zwischen Kultur und Natur: Beiträge der 10. Fachtagung der Bundesarbeitsgruppe (BAG) Fledermausschutz im NABU/LBV vom 1.–3. April 2011 in Benediktbeuern zum Jahr der Fledermaus 2011/2012 / ed. Ruth Petermann – Bonn-Bad Godesberg: Bundesamt für Naturschutz, 2012. – 234 p. (Naturschutz und biologische Vielfalt 128).

[7] Meschede, A. & Rudolph, B.-U. (ed., 2004): Fledermäuse in Bayern. Stuttgart.

working in cooperation with the Academy for nature conservation in Laufen (Akademie für Naturschutz in Laufen – ANL) regularly offer courses on special bat-related topics ("bat conservation for beginners", training in using detectors). Since 2012, the ANL has offered a training programme leading to certification as a certified "bat advisor". Representatives of the coordination offices present the topic of bat conservation at the ANL's seminars on impact-mitigation planning and on wind energy.

In addition, the coordination offices offer training courses, as needed, at the administrative district level.

In 2005, the southern Bavarian coordination office prepared a CD, entitled "Tools and resources for bat conservation" ("Arbeitshilfen zum Fledermausschutz"), that is intended to serve as a guide for bat conservationists. The CD is regularly updated. Its contents include aids for species identification; a guide to using bat detectors; a lecture on "biology and protection of bats"; guidelines for dealing with injured and dead bats, and on surveying and protecting roosts; bat-oriented construction instructions; photos of bats and their habitats; information sheets and literature on various relevant topics. In 2013, the southern Bavarian coordination office revised the colour-coded bat-identification key that had been in place for several years. It is available as a PDF file.

Berlin

The key measures in the open-ended bat conservation programme run by Berlin's supreme nature conservation authority have included checking winter roosts with regard to population sizes and status / need for protection. Government authorities, housing associations and even private building owners have been advised regarding the need for bat conservation. For bats dwelling in buildings, numerous man-made roosts have been affixed to buildings.

Brandenburg

- Coordination and organisation of mammal surveys and conservation, including all bat species, by the Zippelsförde nature conservation station of the Brandenburg state environmental authority; the nature conservation station performs this task with respect to both the lower nature conservation authorities and volunteer conservationists. It also coordinates scientific studies in this area, and it is responsible for approving, guiding and advising banding programmes in the state.
- Continuation of the programme for monitoring maternity roosts of the greater mouse-eared bat.
- Continuation of the programme for monitoring important bat winter roosts and selected maternity roosts.
- Continuation of the long-term studies being carried out by bat banders working in the state of Brandenburg (including studies on the population structures of individual bat species, the relationships between summer and winter roosts, roost loyalty in winter roosts, possibilities for using bat boxes to encourage bats to settle in specific areas, age structures of individual bat species, importance of different roost types, interactions between different roosts of individual species, etc.).

Hamburg

The city's Office for urban development and the environment plans to prepare a concept for a long-term programme for bat surveys in Hamburg.

Mecklenburg – Western Pomerania

The state of Mecklenburg – Western Pomerania does not have a full-time coordination office for bat conservation. Relevant coordination is carried out by staff of the state's authority for the environment, nature conservation and geology (LUNG), by a project-staff person of the German Nature and Biodiversity Conservation Union (NABU) and by volunteers.

Lower Saxony

- State-wide system of bat conservationists

- Continuation of telemetric studies to identify roosts of the serotine bat, pond bat, barbastelle bat and Bechstein's bat

North Rhine – Westphalia
- Support for bat roosts and/or public-awareness measures relative to bats is/are provided by about 25 of the some 40 biological stations in NRW. Ten of those stations also participate in long-term bat monitoring relative to the Habitats Directive.

Saarland
No changes

Saxony
- Ongoing support for important bat roosts in the state, provided by volunteer nature conservationists and private nature conservation associations. The support includes optimisation measures and population surveys.
- Preparation of measures for optimising potential roosts for the lesser horseshoe bat, under commission to the Saxony state office for the environment, agriculture and geology (LfULG).

Saxony-Anhalt
- Transfer of the function of state reference point/centre for bat conservation to the administration of the Karstlandschaft Südharz biosphere reserve, with state-wide effectiveness
- Since 2009, active monitoring for paramyxoviruses has been carried out, in cooperation with the Friedrich Löffler Institute, for the species soprano pipistrelle, Nathusius's pipistrelle and Brandt's bat.

Thuringia
- Since 1996, the state has had a coordination agency for bat conservation in place, with the following tasks: carrying out public-awareness measures; providing support for the work of volunteer bat conservationists; serving as central point of contact and clearinghouse; providing advising; providing training and further training; helping to integrate the interests of bat conservation in specialised planning; carrying out species monitoring and integrating such monitoring in inter-Länder programmes; designing and implementing species-conservation projects; managing data relative to bats.

13. Activities relative to the impacts of pesticides and wood preservatives on bats

Changes and additions to known Länder activities, with respect to the previous report:

Baden-Württemberg
During the period covered by the report, cases of wood-worm infestation in churches were handled predominantly with fumigation procedures. The companies that carry out such work regularly contact the working group for bat conservation in the state (AG Fledermausschutz Baden-Württemberg e.V.) or the Northern Baden coordination office for bat conservation (Koordinationsstelle für Fledermausschutz Nordbaden – (KFN), regarding potential bat populations in the structures being fumigated. But since such procedures are not subject to permit requirements, it is not known whether all such projects are being made known in advance and reviewed for compatibility with the needs of bat conservation.

In cases in which bat populations are discovered in relevant churches, in the Karlsruhe administrative region, protection measures are carried out that are selectively chosen, in keeping with the type of roost concerned, pursuant to information published by the coordination offices for bat conservation in Bavaria (Hammer & Zahn). The pamphlet is entitled "Bat conservation in churches in connection with

fumigation of church interiors" ("Fledermausschutz in Kirchen im Zuge von Begasungsmaßnahmen in Kircheninnenräumen"[8].

Bavaria

In 2013, in connection with inspections of several southern Bavarian buildings for their suitability as roosts for mouse-eared bats and lesser horseshoe bats, the State office for the environment (LfU) analysed wood samples from the roof frames of six buildings, and two samples of droppings – one of old droppings of lesser horseshoe bats and one of fresh droppings of mouse-eared bats – for lindane and pentachlorophenol (PCP). Five of the samples showed only traces of PCP. The PCP concentrations in two of the samples, at 5.5 and 17 mg/kg, were within the range expected following treatment of the wood, at some earlier time, with a substance containing PCP. Only low concentrations of lindane were present in the samples. In the sample of droppings from mouse-eared bats, which was taken from a church known to have been treated with wood preservatives, PCP was found in a concentration of 1.7 mg/kg.

Brandenburg

No further measures, except the publication of an updated list of bat-friendly wood preservatives from Teubner et al. 1998: "Fledermausschutz im Siedlungsbereich – Hinweise zur Biotop- und Landschaftspflege" ("Bat conservation in settlement areas – tips for biotope and landscape management"). – DVL, special issue, 1998.

Mecklenburg – Western Pomerania

The publication "animals on buildings" ("Tiere an Gebäuden")[9] devotes an extensive chapter to protection of "house-dwelling" bats. This publication includes a list of wood preservatives that do not "endanger" bats when applied in accordance with the described precautions.

Saxony-Anhalt

In the framework of a complete census of the lesser horseshoe bat, a number of roosts were inspected for pollutants. The relevant concentrations in currently used roosts were found to be low.

Thuringia

Since the end of 2013, the foundation Stiftung Fledermaus, in cooperation with partners, has been carrying out the interdisciplinary research project "Historic buildings as biodiverse habitats and as focuses of monument preservation" ("Historische Gebäude als biodiverser Lebensraum und Objekt der Denkmalpflege"). The foundation is sponsoring the effort. This project, which is being funded by the foundation Deutsche Bundesstiftung Umwelt (DBU), is aimed at analysing the effects of wood preservatives that bats inhale as the result of wood-maceration processes. The effort, which is focusing especially on populations of the lesser horseshoe bat and of the greater mouse-eared bat, also calls for developing general guidelines for techniques and procedures, for renovating historic buildings, that are both bat-friendly and effective in their monument-preservation results.

During World War II wooden structures were treated with flame retardents .Thereafter wood maceration took place and and even nowadays the load-bearing wooden elements endanger bats. This has emerged as a serious problem in the field of monument preservation. The particulate matter that is released upon such maceration can contain any wood preservatives applied in earlier treatments. Bats inhale such substances along with the particulate matter. Previous studies of problems related to use of wood preservatives focused primarily on bat contamination via direct contact with treated wood, at bats' hanging sites. Incorporation via inhalation has received virtually no attention.

[8] http://www.fledermaus-bayern.de/content/upload/archiv/merkblatt_kirchensanierung.pdf

[9] LAUN (1997): Tiere an Gebäuden. Artenschutz bei Sanierungsmaßnahmen und Rekonstruktionsarbeiten in Stadt und Dorf. – Schriftenreihe des LAUN, H. 1/1997

D. Method of function of the Agreement

14. International cooperation

Numerous German bat conservationists network closely with their European counterparts, take part in their conferences (just as their counterparts participate in German conferences) and/or travel abroad in order to make assessments related to bat conservation (for example, in Luxembourg, Denmark, Norway and Austria). A number of contacts have developed via cooperation in trans-boundary projects and via regular expert exchanges – involving, for example, experts in Baden-Württemberg/Switzerland, Bavaria/Czech Republic, Bavaria/Austria/Italy (inter alia, via the Interreg programme), Brandenburg/Poland (an Interreg project on the bat winter roost in the Ostquellbrauerei (Ostquell Brewery) in Frankfurt (Oder)), Mecklenburg – Western Pomerania / Poland (volunteer cooperation), Thuringia/Czech Republic/Slovakia.

In one relevant example, project partners from Germany, Austria and Switzerland are co-operating in the research and development (R&D) project "Identification of bat migration routes and corridors" ("Identifizierung von Fledermauswanderrouten und –korridoren") (cf. also Chap. 15.13), an effort supported by the Federal Agency for Nature Conservation (BfN), with funding of the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB).

Bavaria and Thuringia have provided bat data for the development of a European bioversity indicator in the effort "European bat population trends – a prototype biodiversity indicator" (cf. Chap. 15.15).

Bat experts from Brandenburg are working in cooperation with Mongolian scientists of the biology department of the University of Ulan Bator on a study of bat biodiversity in Mongolia. Working under commission to the Frankfurt Zoological Society, experts from the state of Hesse have prepared an inventory of bats in the national park Belovezhskaya Pushcha in Belarus (ITN/Dr. Markus Dietz).

The foundation Stiftung Fledermaus in Thuringia is a founding partner, a member of the Board of Trustees and the German representative of/to the BATLIFE EUROPE European umbrella association for bat conservation. BATLIFE EUROPE was founded in 2011.

15. Measures for implementation of the resolutions of the Meeting of the Parties

15.1. MOP 2 Resolution No. 2.2 / MOP 5 Resolution 5.4: Consistent Monitoring Methodologies, Monitoring of Bats Across Europe

In Chap. 5, reference is made to consistent, Germany-wide FFH monitoring in fulfillment of reporting obligations pursuant to Art. 17 of the Habitats Directive. The list below presents additional, complementary methods that a number of German Länder are using to survey the species listed (where the species occur on their territories). Much checking of roosts in Germany's territory is carried out by volunteer bat conservationists. Such measures are often focused on roost protection. The resulting data are stored and administrated on a decentralised basis, in the relevant Länder (cf. Chap. 5).

Lesser horseshoe bat (*Rhinolophus hipposideros*)

Bavaria: Colony censuses (of females) carried out via on-site roost inspections, and counting of emerging bats, In June/July; counting of overwintering bats in winter roosts in January/February.

Hesse:	Winter-roost counts
Saxony:	Application of the so-called "Vilm criteria"[10] for roost checks: synchronous roost checks in early July (counting of adult bats) and at the end of July/ beginning of August (counting of adult and juvenile bats)
Thuringia:	Surveys of maternity roosts in keeping with the Vilm criteria[10]

Greater mouse-eared bat (*Myotis myotis*)

Baden-Württemberg:	The bat-conservation working group AG Fledermausschutz Baden-Württemberg e.V. participates in keeping with consistent criteria[10], 2nd counts are not always rigourously in keeping with specific methods
Bavaria:	Colony counts (maternity roost bats) via on-site inspections in the period July through the beginning of August; for some roosts, counts of emerging bats are also carried out. For a selection of southern Bavarian colonies, adults (May/June) and juveniles (June/July) are counted in two separate counts; overwintering bats are counted in winter roosts from mid-November to the beginning of March
Berlin:	Regular surveys via counts in winter roosts
Hesse:	Net captures / telemetry / detector recordings in the framework of federal and state monitoring; light-barrier counts at summer and winter roosts
Lower Saxony:	Two emergence counts, in June and in July, and on-site inspections with counts of mouse-eared bats
North Rhine – Westphalia:	Monitoring of roosts. With regard to maternity roosts, the nationally agreed consistent monitoring programme[10] is being applied wherever possible.
Saarland:	Along with monitoring relative to the Habitats Directive, volunteer-based checks of maternity roosts and winter roosts
Saxony:	Observance of the "Vilm criteria" for roost checks: Roost checks in mid-May / at the end of May (counts of adult bats) and at the beginning of July (counting of adult and juvenile bats).
Saxony-Anhalt:	Participating in national monitoring of mouse-eared bats[10]
Thuringia:	Surveys of maternity roosts in keeping with the Vilm criteria[10]

Bechstein's bat *(Myotis bechsteinii)*

Bavaria:	Winter-roost counts in the framework of monitoring of roosts under long-term observation in Bavaria. Only small numbers of bats are monitored in the winter roosts, however.
Hesse:	Net captures / telemetry / detector recordings in the framework of federal and state monitoring
Lower Saxony:	To some extent, basic population surveys are still being carried out; checks of bat boxes in a reference area are also being carried out, however
Saarland:	Net captures are carried out, but not systematically, however; emergence counts at maternity roosts
Saxony:	Emergence counts following roost search, via telemetry, in the framework of FFH monitoring
Thuringia:	Winter-roost monitoring

Serotine bat (*Eptesicus serotinus*)

[10] Cf. Bundesamt für Naturschutz (Hrsg) (2003): Grundlagen für die Entwicklung eines Monitorings der Fledermäuse in Deutschland. Bonn, 68 p. BfN-Skripten 73.

Bavaria:	Winter-roost censuses in the framework of monitoring of roosts under long-term observation in Bavaria. Only small numbers of bats are monitored in the winter roosts, however.
Berlin:	For organisational and financial reasons, no monitoring programme has yet been commenced.
Bremen:	Monitoring in the framework of Bremen's integrated survey programme: Detector-based mapping at 6-year intervals, in selected parks and forests
Hesse:	Net captures / telemetry / detector recordings in the framework of federal and state monitoring
Lower Saxony:	Two emergence counts, in June and July. In addition, telemetric identification of alternative roosts.
Saxony:	Two emergence counts: end of May, beginning of June (counting of adult bats)
Thuringia:	Winter-roost monitoring

Northern bat (*Eptesicus nilssonii*)

Bavaria:	Winter-roost censuses in the framework of monitoring of roosts under long-term observation. Only small numbers of bats have been sighted in the winter roosts, however.
Hesse:	Detector recordings in the framework of state monitoring
Lower Saxony:	Regular monitoring has not yet been carried out. Two emergence counts, in June and July.
Saxony:	Two emergence counts: end of May, beginning of June (counting of adult bats)
Thuringia:	Winter-roost monitoring

Common noctule bat (*Nyctalus noctula*)

Bavaria:	Regular monitoring is carried out at about 15 roosts in southern Bavaria, in the form of emergence counts in spring or fall. Some counts in roosts are also carried out. An additional 38 roosts are checked sporadically.
Berlin:	Regular checks of two important winter roosts
Bremen:	Monitoring in the framework of Bremen's integrated survey programme: Detector-based mapping at 6-year intervals, in selected parks and forests
Hesse:	Net captures / telemetry / detector recordings in the framework of federal and state monitoring
Saxony:	Two emergence counts: end of May, beginning of June (counting of adult bats)

15.2 MOP 2 Resolution No. 2.3: Transboundary Programmes, Species Proposals

The focuses of the research and development project "Identification of bat migration routes and corridors" ("Identifizierung von Fledermauswanderrouten und –korridoren") (see also Chap. 15.13) include the migratory behaviour of Nathusius' pipistrelle. In addition to conducting extensive evaluations of sighting / banding data from Germany and neighbouring countries, the project is studying the species' migratory movements with the help of acoustic surveys carried out along a transect in the Thuringian Forest.

Nathusius's pipistrelle is currently being studied in several Länder with regard to the threats it faces from wind turbines. In one such effort in Hesse, long-term monitoring of the species is being conducted in forests using bat detectors.

In 2012 in Saxony, the largest (by far) known maternity roost of Nathusius's pipistrelle – comprising 625 individuals – was discovered in the framework of approval procedures for wind turbines.

In 2012 and 2013, the working group "Baltic Sea bat migration" ("Arbeitsgruppe Fledermauszug Ostsee") produced new evidence of the occurrence of Nathusius's pipistrelle during the migration period – at an island (about 12 km offshore) and in other offshore locations.

15.3 MOP 2 Resolution No. 4: Transboundary Programmes, Habitat Proposals / MOP 4 Resolution No. 4.3: Guidelines for the Protection and Management of Important Underground Habitats

Most of the Länder have updated their lists of important underground roosts and provided them to the Eurobats Secretariat. The current (overall) list contains 301 data records, most including details about the occurring species and the measures undertaken to protect them. While the roosts enjoy guaranteed legal protection, via Arts. 39 and 44 Federal Nature Conservation Act (BNatSchG) and via a range of partly complementary Länder laws, not all of them are properly physically protected against unauthorised entry. Many important winter roosts have been registered as FFH areas or are subject to other nature conservation regulations.

Along with illegal entry by would-be "speleologists", "geocachers"' attraction to underground roosts is proving to be a growing problem (cf. Chap. 4).

Regarding forests as bat habitat, see also Chap. 15.4.

15.4 MOP 4 Resolution No. 4.4 / MOP 6 Resolution 6.12: Bat Conservation and Sustainable Forest Management

In 2012, the Institute for faunal ecology and nature education (Institut für Tierökologie und Naturbildung – ITN, Dr. Markus Dietz), working under commission to the Federal Agency for Nature Conservation (BfN), prepared a report entitled "Evaluation of forest-development concepts and forestry programmes of the Länder with regard to bat conservation / a contribution to the implementation of EUROBATS Resolution 6.12 ("Auswertung der Waldentwicklungskonzepte und Forstprogramme der Bundesländer im Hinblick auf die Berücksichtigung des Fledermausschutzes / Beitrag zur Umsetzung der EUROBATS-Resolution 6.12"). The result of the study: Very few state- (Länder-) wide programmes aimed at supporting forest-dwelling bat species are in place. In most cases, such species are listed as target species in connection with concepts for promotion of old wood / dead wood or with ecological forest-development concepts. In 13 of the 16 Länder (Baden-Württemberg, Bavaria, Berlin, Brandenburg, Hesse, Mecklenburg – Western Pomerania, Lower Saxony, Rhineland-Palatinate, Saarland, Saxony, Saxony-Anhalt, Schleswig-Holstein, Thuringia), special concepts are in place for promotion of old wood / dead wood. Such concepts include binding guidelines for management of state forests that are seen to have direct positive impacts on bats. For private and municipal forests, the options for adopting the guidelines from such old-wood / dead-wood programmes include arrangements involving contractual nature conservation and/or "eco-account" measures. The Länder specifications in the old-wood / dead-wood concepts call for increasing the amount of dead wood present in forests – for example, for increasing the number of habitat trees per hectare from 2 to 10, or to a level of 5 cubic metres or 3 cubic metres of round timber. The nature conservation strategies of most Länder include the concept of protecting relevant small areas / "forest refuges", and the strategies of several Länder provide for "habitat-tree groups" in forests.

Measures to improve bat conservation are generated especially via implementation of Natura 2000 in forests, as long as, in the process, occurring bat species listed in Annex II of the Habitats Directive (FFH Directive) are systematically surveyed in the FFH areas; their habitats are delimited; the habitat structures that are valuable for them are surveyed; and measures are formulated, in pertinent management plans, for protecting the populations found. In Lower Saxony, for example, management plans for forests in FFH areas have to be approved by local nature conservation authorities. In 2010, the state of North Rhine – Westphalia issued "Instructions for species protection in forests and for assessing the suitability of measures in NATURA 2000 areas within the state's forestry operations"

("Dienstanweisung zum Artenschutz im Wald und zur Beurteilung der Unbedenklichkeit von Maßnahmen in NATURA 2000-Gebieten im landeseigenen Forstbetrieb"), along with a guide entitled "Species protection in connection with approval and notification procedures under forest law" ("Artenschutz bei forstrechtlichen Genehmigungs- und Anzeigeverfahren"). In Hesse, so-called "sponsor forest authorities" (Patenforstämter) have agreed to carry out special conservation measures for relevant plant and animal species occurring in their districts. The bat species that profit from such measures include the barbastelle and Bechstein's bat.

In 2013, the project "Promotion of a network of Bechstein's bat colonies in the European population centre – development and implementation of efficient conservation measures to be integrated within forest management" ("Förderung eines Kolonieverbundes der Bechsteinfledermaus im europäischen Populationszentrum – Entwicklung und Umsetzung von effizienten Schutzmaßnahmen zur Integration in die forstliche Bewirtschaftung") was launched in Hesse. The project is being run within the federal "Biological Diversity" programme that was launched in 2011 in support of the National Biodiversity Strategy, and that provides support options especially for conservation measures for the barbastelle and Bechstein's bats. Within the effort, 20 to 25 maternity colonies are being identified and protected as core populations of the species. Furthermore, species-specific criteria for forest management in the project area are being developed and implemented on the basis of population maps and of a habitat analysis. In addition, a (nationally applicable) practical guide and measures catalogue is being developed, with specific management criteria and recommendations for protection measures in forests and in open-land habitats, and for measures to network habitats. Plans call for the guide to include an overview of relevant options for financing, for legal safeguarding of measures and for implementation with the help of compensation measures and "eco-point accounts". Public awareness of the issue is being promoted via suitable campaigns and nature-education events. The intention is for many other species of mature forest ecosystems to profit as well from the measures to protect habitat structures of Bechstein's bat.

The project "Development and promotion of old-wood and dead-wood biocenoses via sustainable management strategies in the Saarland's forestry operations" ("Entwicklung und Förderung von Alt- und Totholzbiozönosen durch eine nachhaltige Bewirtschaftungsstrategie in saarländischen Forstbetrieben") in the Saarland (cf. Chap. 11) is also being promoted in the framework of the federal programme. That project is aimed at integration of old-wood and dead-wood resources within sustainable forest management. At sample sites, the project is surveying bat fauna in old-wood and dead-wood resources, along with vegetation and various species groups.

15.5 MOP 4 Resolution No. 4.6 / MOP 5 Resolution 5.5: Guidelines for the Issue of Permits for the Capture and Study of Captured Wild Bats

Capture and banding of bats is subject to requirements for approval under species-conservation laws pursuant to Art. 45 Federal Nature Conservation Act (BNatSchG). The following overview presents the information provided by the Länder regarding competent approval authorities and observance of the "Recommendations of the body of experts regarding bat marking with arm bands in Germany" ("Empfehlungen des Sachverständigengremiums zur Fledermausmarkierung mit Armklammern (Fledermausringen) in Deutschland"):

	Permits issued by	**Conformance with above recommendations**
Baden-Württemberg BW	Regional councils / higher nature conservation authorities	**Yes**
Bavaria BY	Higher nature conservation authority (district government)	Yes
Berlin BE	Supreme nature conservation authority	Yes

Brandenburg BB	State office for the environment, health and consumer protection	Yes
Bremen HB	Senator for the environment, building and transport	No application during the period covered by the report
Mecklenburg – Western Pomerania MV	Inferior nature conservation authorities	Yes
Lower Saxony NI	Inferior nature conservation authorities	Yes
Saarland SL	Supreme nature conservation authority (State office for the environment and occupational	No application for approval submitted to date
Saxony SN	Inferior nature conservation authorities	Yes
Saxony-Anhalt ST	State agency for environmental protection (Landesamt für Umweltschutz)	Yes
Thuringia TH	Inferior nature conservation authorities	Yes

15.6 MOP 4 Resolution No. 4.7 / MOP 6 Resolution 6.11: Wind Turbines and Bat Populations

During the period covered by the report, a number of federal research projects aimed at reducing the dangers that wind turbines pose for bats (cf. Chap. 4) were begun, completed or published. Among these are the following projects funded by the Federal Environment Ministry:

- "Reduction of bats' risk of collision with onshore wind turbines" ("Reduktion des Kollisionsrisikos von Fledermäusen an Onshore-Windenergieanlagen" – RENEBAT I)[11] (with contents including: methods for acoustically surveying bats' activities at wind turbines; determination of collision risks on the basis of acoustic activity; and development of bat-friendly control algorithms for wind-turbine operation, taking account of factors such as the month, time of night and measured wind speed – a method to predict activity and, thus, bats' risk of collision in rotor areas of wind turbines)
- The first follow-on project, RENEBAT II: "Reduction of bats' risk of collision with onshore wind turbines" (contents: "Practical test": Analysis of the effectiveness of bat-friendly operation; communication of the resulting approach to practitioners; study of a range of issues relevant to actual operations; and tests of equipment and methods) (completed in 2012).
- The second follow-on project, RENEBAT III: "Determination, in planning practice, of bats' risk of collision with onshore wind turbines" ("Bestimmung des Kollisionsrisikos von Fledermäusen an Onshore-Windenergieanlagen in der Planungspraxis") (begun in 2013) (contents/aims: Simplification of relevant surveys; analysis and reduction of bats' risk of collision with wind turbines; intensified relevant standardisation; and limitation of costs and time investments for relevant studies to the necessary minimum).

Although the EUROBATS guidelines call for refraining from installation of wind turbines in forest areas, most German Länder have been turning to such installation as part of efforts to reach wind-energy-use objectives. In 2011, the Federal Agency for Nature Conservation (BfN) published a position paper entitled "Wind power over forests" ("Windkraft über Wald")[12] that set forth basic guidelines for wind-energy installations that are compatible with the interests of nature conservation and landscape preservation. The paper also identified areas that should be kept free of such installations and described what further research is needed. In 2012, then, that paper led to the BfN's R&D project "Studies for reducing the impacts of wind turbines on bats, especially in forests" ("Untersuchungen zur Minderung der Auswirkungen von Windkraftanlagen auf Fledermäuse, insbesondere im Wald") (contractor for the project: Freiburg Institute of Applied Animal Ecology (FrInaT GmbH Freiburg), along with several project partners). In addition to conducting extensive studies of the relevant literature, the project is also studying the ways in which different bat species use space in different strata – also with

[11] Brinkmann, R., Behr, O., Niermann, I. & M. Reich (Hrsg.) (2011): Entwicklung von Methoden zur Untersuchung und Reduktion des Kollisionsrisikos von Fledermäusen an Onshore-Windenergieanlagen. – Umwelt und Raum Bd. 4, 457 p.

[12] http://www.bfn.de/fileadmin/MDB/documents/themen/erneuerbareenergien/bfn_position_wea_ueber_wald.pdf

a view to identifying potential impacts from construction and operation of wind turbines. The project is also working to formulate minimum standards for preliminary studies and monitoring, from a qualified perspective of nature conservation.

The following additional research projects are also focusing – at least in part – on the problem area of "bats and wind power":

- BMU project: "Construction and operations monitoring relative to the impacts of wind turbines in forests" ("Bau- und Betriebsmonitoring zu den Auswirkungen von Windenergieanlagen im Wald") (bats: evaluation of existing data, comparisons of forest sites / open-land sites. The aims include derivation of recommendations for site selection and planning)
- Federal Agency for Nature Conservation (BfN) project: "Ecologically compatible expansion of wind-energy use on land" ("Naturverträglicher Ausbau der Windkraftnutzung an Land").

In general, in construction of wind turbines, affected bat populations are to be taken into account in impact mitigation and management. Most German Länder now have guides that provide either binding or recommended criteria for site planning, preliminary and follow-up studies, monitoring and compensation measures; as well as binding or recommended criteria for use of bat-friendly control algorithms for wind-turbine operation (this holds for the Länder Baden-Württemberg, Bavaria, Brandenburg, Hesse, Lower Saxony, North Rhine – Westphalia, Rhineland-Palatinate, Saarland and Schleswig-Holstein; such a guide is now in preparation in Thuringia). In addition, even those Länder that still lack state-wide guides list measures such as shutdown periods, gondola monitoring and/or use of bat-friendly control algorithms for wind-turbine operation (for example, Berlin, Bremen, Hamburg).

15.7 MOP 4 Resolution 4.12: Priority Species for Autecological Studies

Information provided by the Länder regarding studies of occurring priority species for autecological studies:

Greater horseshoe bat *(Rhinolophus ferrumequinum)*

Baden-Württemberg: Targeted studies to determine population sizes, carried out in the framework of the management plans "Wiesen bei Waldshut" and "Südwestlicher Heuberg" (individuals). A book project initiated by the Freiburg regional council, on the ecology of three bat species (including Geoffroy's bat), presented extensive data on the migratory and roosting behaviour of the species. Financing, by the Freiburg regional council, of a project for study of an important winter and swarming roost in a decommissioned mine.

Bavaria: Special species support programmes and regular monitoring. In the years 2008-2011, the Bavarian state office for the environment (Landesamt für Umwelt) conducted extensive studies of the diet of the greater horseshoe bat[13].

Saarland: Studies of population ecology, carried out in 2012; it was determined that the population forms a joint population (metapopulation) with the colonies in Lorraine and Luxembourg.

Lesser horseshoe bat (*Rhinolophus hipposideros*)

Bavaria: Special species support programmes, and regular monitoring; in 2013/14, a project to improve the roost situation of the lesser horseshoe bat in southern Bavaria

Saxony: Regular population counts in summer roosts; genetic-diversity studies based on analysis of guano samples[14]

Saxony-Anhalt: Total census pursuant to the concept for monitoring relative to the Habitats Directive

Thuringia: In the framework of the state's species support programme for the lesser horseshoe bat, regular studies of the species, and collection of population data. The activities carried out during the period covered by the report included monitoring, mapping in areas with deficits and telemetric roost searches.

Geoffroy's bat (*Myotis emarginatus*)

Baden-Württemberg: See the book project described relative to the greater horseshoe bat. Net captures and subsequent telemetric monitoring of female Geoffroy's bats in the southern district of Rastatt, on the basis of known hunting populations at livestock stalls. By following two bats fitted with transmitters, a previously unknown maternity roost was found in the joinery of an old mill.

Bavaria: Regular monitoring

North Rhine – Westphalia: In 2010 telemetric monitoring of six bats, in order to provide data about the species' hunting areas, flight routes and roosts in the Heinsberg district[15].

[13] Wolz, I. (2011): Untersuchungen zum Beutespektrum der Großen Hufeisennasen - 2008 - 2011, Hohenburg / Opf. Schriftenr. des Bayerischen Landesamtes für Umwelt, http://www.bestellen.bayern.de/

[14] Stefen, C. & Tuma, M. (2013): Methodische Untersuchungen zur populationsgenetischen Differenzierung von Fledermauskolonien im Vergleich von zwei Fledermausarten mit unterschiedlichen Systemen der Raumnutzung für die Beurteilung des Erhaltungszustandes. - Abschlussbericht im Auftrag des LfULG, 31 p.
Stefen, C., Stuckas, H. & Bartel, M. (2013): Methodisch erweiterte Untersuchungen zur populationsgenetischen Differenzierung von Fledermauskolonien durch Analyse von Kern-DNA für die Beurteilung ihres Erhaltungszustandes. - Abschlussbericht im Auftrag des LfULG, 15 p.

[15] Straube, M. (2010): Telemetrie der Wimperfledermaus (Myotis emarginatus) im Kreis Heinsberg. - Unveröff. Gutachten im Auftrag des LANUV, Recklinghausen.

15.8 MOP 5 Resolution No. 5.2: Bat Rabies in Europe

The recommendations of the Standing Committee on Vaccination (STIKO) at the Robert Koch Institute (RKI) (last revision: August 2013)[16] call for persons who are at risk due to their occupations to be immunised. In addition to veterinarians, hunters, persons working in forestry management and certain others, the pertinent group of persons also includes persons who come into close contact with bats, for professional or other reasons. Persons with continuing risks of exposure are urged to have regular boosters. Also at the Länder level, persons active in bat conservation or bat research are normally urged to have a rabies vaccination.

The Friedrich Loeffler Institute (FLI), Germany's National Institute of Animal Health, serves as the country's national reference laboratory for rabies (on the basis of the Ordinance for Protection against Rabies (Tollwut-Verordnung – TW-VO) of 11 April 2001 (Bundesgesetzblatt I 2001 p. 598) in conjunction with the decision of the Federal Ministry of Food, Agriculture and Consumer Protection (BMELV) of 8 July 1997). The institute – in part, in the framework of special research projects – collects and evaluates rabies data from throughout Europe and carries out passive monitoring of EBLV infections of indigenous bats[17]. The bats most commonly affected by the virus (European bat lyssavirus – EBLV-1) are serotine bats. In October 2012, a rabies-positive Natterer's bat was discovered in Bavaria's Lichtenfels district. The bat represented the second case found of Bokeloh Bat Lyssavirus (BBLV). The FLI web site notes that BBLV is presumably endemic in the central European Natterer's bat population.

Since 1998, in a study carried out in the framework of the Lyssavirus Research Network (http://lyssavirus.fli.bund.de), which is financially supported by the Federal Ministry of Education and Research (BMBF), a total of 5,478 individuals, representing 21 bat species and all 16 German Länder, have been tested, and the test results have been published.[18]

Saxony-Anhalt began carrying out a programme of active rabies surveillance in 2007, in cooperation with the Friedrich Löffler Institute. That programme concluded in 2013 (cf. Schatz et al.[19]).

In the Länder, finds of dead bats are sent for testing – depending on the applicable responsibilities – to the Leibniz Institute for Zoo and Wildlife Research (IZW), Berlin (this is the case, for example in Mecklenburg – Western Pomerania and in Hesse), to veterinary authorities (Bremen) or to the competent Land (state) authority (Saarland: State office for consumer protection (Landesamt für Verbraucherschutz)). The results of such testing are forwarded to the national rabies laboratory (FLI Wusterhausen). Like North Rhine – Westphalia, Thuringia and Brandenburg, Saxony also participates in passive surveillance. Since bat rabies is an animal disease that falls under disease reporting regulations, any known case has to be listed within the Federal Republic of Germany's animal disease information system (ADIS).

North Rhine – Westphalia reports that local and regional press/media coverage of bat rabies is always objective and enlightened. In the Saarland, when persons are found to have come into contact with bats that have tested positive for rabies, the press provides enlightened, informative coverage in order to counter any negative public reactions.

Web sites of the federal and Länder chambers of veterinarians (such as that of the Saarland) provide information about how to deal with bats suspected of being infected and with general rabies risks.

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[16] Epidemiologisches Bulletin, 26. August 2013/ Nr. 34

[17] http://www.fli.bund.de/no_cache/de/startseite/institute/institut-fuer-molekulare-virologie-und-zellbiologie/nrl-labore/oie-und-nrl-fuer-tollwut.html, Stand 8.5.2014

[18] Schatz, J., Freuling, C.M., Auer, E., Goharriz, H., Harbusch, C. et al. (2014): Enhanced Passive Bat Rabies Surveillance in Indigenous Bat Species from Germany – A Retrospective Study. PLoS Negl Trop Dis 8 (5): e2835. doi:10.1371/journal.pntd.0002835

[19] Schatz, J., Ohlendorf, B., Busse, P., Pelz, G., Dolch, D., Teubner, J., Encarnação, J.A., Mühle, R.-U., Fischer, M., Hoffmann, B., Kwasnitschka, L., Balkema-Buschmann, A., Mettenleiter, T.C., Müller, T. & C.M. Freuling (2014): Twenty years of active bat rabies surveillance in Germany: a detailed analysis and future perspectives. - Epidemiol Infect 142:1155-1166, Epub 2013 Sep 6.

Comprehensive, objective information is provided by an FLI brochure entitled "Fledermäuse: Artenschutz und Tollwut" ("Bats: conservation and rabies") (last revision: 10 June 2013).[20]

15.9 MOP 5 Resolution No. 5.7: Guidelines for the Protection of Overground Roosts, with Particular Reference to Roosts in Buildings of Cultural Heritage Importance

A survey of the Länder regarding important overground roosts yielded information from Bavaria, Berlin, Lower Saxony, North Rhine – Westphalia, the Saarland, Saxony, Saxony-Anhalt and Thuringia. An analysis of the some 3,250 sets of (raw) data that need to be reviewed has been commissioned and is currently underway. Some Länder with coordination offices (such as Bavaria) maintain databases with state-wide lists. In other Länder (Brandenburg, Mecklenburg – Western Pomerania), information about important bat roosts is provided to the competent authorities for relevant approvals.

All roosts enjoy legal protection.

In Saxony, pursuant to Art. 24 Saxony Nature Conservation Act (SächsNatSchG) (corresponding to Art. 54 (7) Federal Nature Conservation Act (BNatSchG)), measures to protect habitat sites, in structures, of bats whose populations are threatened or are strictly protected are permissible to the extent that they are reasonable for owners.

The Länder have reported the following recommendations:

Bavaria: Bat protection in churches, in connection with renovations – http://www.fledermaus-bayern.de/content/upload/archiv/merkblatt_kirchensanierung.pdf

North Rhine – Westphalia: In connection with planned construction: The recommendation "species protection in urban land-use planning and in project approvals under construction law" ("Artenschutz in der Bauleitplanung und bei der baurechtlichen Zulassung von Vorhaben"), published on 22 October 2010. Available from: http://www.naturschutzinformationen-nrw.de/artenschutz/de/downloads

15.10 MOP 6 Resolution No. 6.5: Guidelines on Ethics for Research and Field Work Practices

In Baden-Württemberg, relevant requirements are imposed in connection with special-case authorisations.

In Bavaria, such guidelines are considered unnecessary, since the relevant legal provisions (nature conservation and animal welfare laws) provide for studied animals to be handled with the greatest care and for impairments to be avoided.

In Thuringia, the guidelines are observed.

The State office for environmental protection (Landesamt für Umweltschutz) in Saxony-Anhalt monitors compliance in cooperation with the bat reference office– in part, in the framework of approvals for banding and telemetry.

[20] http://www.fli.bund.de/fileadmin/dam_uploads/Publikationen/FLI-Informationen/FLI_Information_Fledermaeuse20130610.pdf

15.11 MOP 6 Resolution No. 6.6: Guidelines for the Prevention, Detection and Control of Lethal Fungus Infections in Bats

Some infections of bats with *Geomyces destructans* have been reported from Germany. *Geomyces destructans* has not been known to cause mass mortalities of bats in Europe.[21]

The following German Länder provided information relative to the "Guidelines for the Prevention, Detection and Control of Lethal Fungus Infections in Bats":

Management of fungus infections in bats: cases of *Geomyces destructans*				
	Infections occur (sporadically) in bats	**Manage-ment plan in place**	**Information / awareness measures**	**Participation in research, projects, or similar**
Bavaria	Yes	No	At bat conferences	Participation in genetic studies at the University of Greifswald, participation in a study of the Leibniz Institute for Zoo and Wildlife Research (IZW) (working group of Dr. G. Wibbelt)
Brandenburg	No finds to date	No information	No information	Participation in a study of the Leibniz Institute for Zoo and Wildlife Research (IZW) (working group of Dr. G. Wibbelt)
Mecklenburg – Western Pomerania	No information	No information	No information	Study of samples at the University of Greifswald
North Rhine – Westphalia	Yes	No	No information	No information
Saxony	Yes	No	No information	Participation in a study of the Leibniz Institute for Zoo and Wildlife Research (IZW) (working group of Dr. G. Wibbelt)
Saxony-Anhalt	No information	No information	No information	Participation in a study of the Leibniz Institute for Zoo and Wildlife Research (IZW) (working group of Dr. G. Wibbelt); monitoring of fungus infections in the greater mouse-eared bat in rocky roosts (including maternity roosts) in the Harz Mountains
Thuringia	No information	No information	Provided by relevant persons	Participation in a study of the Leibniz Institute for Zoo and Wildlife Research (IZW) (working group of Dr. G. Wibbelt)

15.12 MOP 6 Resolution No. 6.7: Conservation and Management of Critical Feeding Areas, Core Areas around Colonies and Commuting Routes

The Länder carry out conservation and management of critical bat habitats outside of roosts in the framework of existing laws (species protection, impact mitigation and management), via voluntary measures / contractual nature conservation programmes (cf. Chaps. 8, 15.4, 15.7), habitat-management measures (in Bavaria, for example) and biotope-networking projects (in Baden-Württemberg, for example).

[21] Puechmaille, S.J., Wibbelt, G., Korn, V., Fuller, H., Forget, F. et al. (2011): Pan-European Distribution of White-Nose Syndrome Fungus (*Geomyces destructans*) Not Associated with Mass Mortality. PLoS ONE 6(4): e19167. doi:10.1371/journal.pone.0019167.

15.13 MOP 6 Resolution No. 6.8: Monitoring of Daily and Seasonal Movements of Bats

The following activities have been and/or are being carried out in the framework of the ongoing R&D project "Identification of bat migration routes and corridors" ("Identifizierung von Fledermauswanderrouten und –korridoren") (contractor: Planungsbüro für angewandten Naturschutz GmbH; with several project partners), supported by the Federal Agency for Nature Conservation (BfN), with funding from the Federal Environment Ministry:

- extensive evaluations of findings relative to migratory behaviour of the four bat species *Nyctalus noctula, Nyctalus leisleri, Pipistrellus nathusii* and *Vespertilio murinus*, via study of literature and banding data,
- compilation of existing migration-research methods,
- collection of additional relevant information about bat migrations, via terrain studies (telemetry of noctule bats in spring migration; acoustic transect in the Thuringian Forest for study of Nathusius' bat; testing of geolocators; isotope analysis of hair).

Baden-Württemberg: Banding, and reading of banding data or re-found bats, are carried out by Dr. Arnold in connection with annual bat-box checks in the forests of the Rheinaue (Rhine meadows) area of northern Baden, between Karlsruhe and Mannheim. The resulting data are transmitted to the relevant banding centre in Bonn.

Bavaria: The importance of watercourses as guiding lines and feeding habitats during migration is being studied in a dissertation currently in progress at LMU Munich university (methods: recordings of bat calls, net captures; Gerges, in prep.). Bats' routes for daily commuting between colonies and feeding habitats are regularly studied in connection with projects involving interventions (especially roads), with a view to preventing or minimizing fragmentation effects.

Brandenburg: During the period covered by the report, a total of 19,614 bandings and 8,221 refinds were recorded:

Bat species	Number of bandings, 2010-2013	Number of refinds, 2010-2013
Barbastella barbastellus	765	493
Eptesicus nilssonii	4	8
Eptesicus serotinus	180	19
Myotis bechsteinii	155	114
Myotis brandtii	87	3
Myotis dasycneme	31	33
Myotis daubentonii	1598	252
Myotis myotis	2249	697
Myotis nattereri	1472	791
Nyctalus leisleri	320	160
Nyctalus noctula	6720	4337
Pipistrellus nathusii	2427	378
Pipistrellus pipistrellus	758	66
Pipistrellus pygmaeus	1241	455
Plecotus auritus	1209	390
Plecotus austriacus	57	2
Vespertilio murinus	341	23

Mecklenburg – Western Pomerania: Migrations of bats across the Baltic Sea have been, and continue to be, studied by the volunteer-based working group "Baltic Sea bat migration" ("Arbeitsgruppe Fledermauszug Ostsee").

Saxony: The Saxony state office for the environment, agriculture and geology (LfULG) serves as the bat-banding centre for eastern German Länder. In 1999, the LfULG entered into pertinent contractual agreements with the competent state authorities of Mecklenburg – Western Pomerania, Brandenburg, Thuringia and Saxony-Anhalt. The numbers of bandings and refinds registered in connection with pertinent banding programmes are shown in the overview below. The aspects covered by the collected data include changes of location, survival rates and population structures.

Bat species	Number of bandings	Number of refinds
Barbastella barbastellus	352	160
Eptesicus nilssonii	18	4
Eptesicus serotinus	20	1
Myotis brandtii	128	61
Myotis daubentonii	113	33
Myotis myotis	2,168	1,311
Myotis mystacinus	86	29
Myotis nattereri	147	96
Nyctalus leisleri	67	111
Nyctalus noctula	767	127
Pipistrellus nathusii	68	11
Pipistrellus pipistrellus	9	4
Pipistrellus pygmaeus	23	1
Plecotus austriacus	1	0
Plecotus auritus	130	219
Vespertilio murinus	35	4
Total	**4,132**	**2,172**

Saxony-Anhalt: The volunteer-based group "Arbeitskreis Fledermausschutz" ("bat conservation working group") and the state's reference point for bat conservation participate in the inter-Länder banding programmes run by the bat-banding centre in Dresden. Financing is provided on the basis of a bilateral contractual agreement between Saxony-Anhalt's state office for environmental protection and Saxony's state office for the environment, agriculture and geology (LfULG).

15.14 MOP 6 Resolution No. 6.9: Year of the Bat

In the "Year of the Bat", the Federal Agency for Nature Conservation (BfN), with funding from the Federal Environment Ministry, financed the 10th conference of the federal working group on bat conservation (Bundesarbeitsgruppe (BAG) Fledermausschutz) in the German Nature and Biodiversity Conservation Union (NABU) / Bavarian bird-conservation society (Landesbund für Vogelschutz – LBV), which took place from 1-3 April 2011 in Benediktbeuern. As a follow-up, presentations made at the event were published in volume (Heft) 128 of the series Naturschutz und Biologische Vielfalt, in a grouping entitled "Fledermäuse zwischen Kultur und Natur" ("Bats between culture and nature"). In addition, the Federal Agency for Nature Conservation, in its BfN-Skript 296, entitled "Fledermausschutz in Europa II" ("bat conservation in Europe II"), published German translations of the 5th and 6th EUROBATS Meetings of the Parties, along with reports on bat conservation in Germany, 2003-2009.

In the German Länder, the extensive public-awareness measures listed in Chap. 9 (European Bat Night, excursions, etc.) have been intensified. In addition, the Year of the Bat has been publicised and much of the relevant provided publicity material has been distributed. On its Web site, the nature conservation foundation Stiftung Naturschutzfonds (Baden-Württemberg) has added links to the "Year of the Bat 2011-2012" Web site of the Convention on the Conservation of Migratory Species of Wild Animals (CMS) and EUROBATS, while the "Fledermaus" foundation in Thuringia has launched a Web presence of its own.

On 25/26 Feb. 2011, an international conference on Bechstein's bat took place in Hesse.

15.15 MOP 6 Resolution No. 6.13: Bats as Indicators for Biodiversity

In 2013, a relevant indicator was developed at the European level, on the basis of population trends in winter roosts[22]. The data that entered into the indicator, a prototype, included two data sets from Germany – a Bavarian set and a Thuringian set.

The Federal Government's National Strategy on Biological Diversity calls for summarising checks of the strategy to be carried out with the help of indicators. To that end, it contains a set of 19 indicators that are tied to the strategy's visions and fields of action and that take account of international requirements. Bat data enter into the two indicators "conservation status of FFH habitats and FFH species" ("Erhaltungszustand der FFH-Lebensräume und FFH-Arten") and "endangered species" ("Gefährdete Arten").[23]

Bavaria does not have any indicators of its own that are focused specifically on bats. At the same time, Bavaria's set of environmental indicators includes the sub-indicator "species support programmes" ("Artenhilfsprogramme") (LfU 2014)[24], which covers mouse-eared bats and a number of other species for which species support programmes have been carried out.

15.16 MOP 6 Resolution 6.14: Impact of Roads and Other Traffic Infrastructures on Bats

Existing legal regulations (species conservation, area conservation, impact regulation under nature conservation law) must be taken into account in execution of traffic-infrastructure measures. As a result, (potential) impacts on bats have to be considered via species protection assessments (saP) and/or FFH-based impact assessments (FFH-based preliminary reviews).

A number of German Länder also observe additional guidelines, and report in this regard as follows:

Baden-Württemberg: Apart from the general forms for saP and FFH preliminary reviews, the state of Baden-Württemberg does not have any special guidelines for taking bats into account in connection with traffic-infrastructure projects. The following resource materials are taken into account by the competent personnel:

- Sächsisches Staatsministerium für Wirtschaft, Arbeit und Verkehr (ed.) (Saxony state ministry for the economy, labour and transport) (2012): Planung und Gestaltung von Querungshilfen für Fledermäuse. Eine Arbeitshilfe für Straßenbauvorhaben im Freistaat Sachsen ("Planning and

[22] Haysom, K., Dekker, J., Russ, J., van der Meij, T. & A. van Strien (2013): European bat population trends - A prototype biodiversity indicator. - EEA Technical report No 19/2013

[23] Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit (2010): Indikatorenbericht 2010 zur Nationalen Strategie zur biologischen Vielfalt. – Berlin, 87 p.

[24] LfU (2014): http://www.lfu.bayern.de/umweltqualitaet/umweltbewertung/natur/artenhilfsprogramme/index.htm

design of crossing aids for bats. A resource for road-construction projects in the Free State of Saxony").[25]

- Landesbetrieb Straßenbau und Verkehr Schleswig-Holstein (ed.) (Schleswig-Holstein state office for road construction and transport) (2011): Fledermäuse und Straßenbau – Arbeitshilfe zur Beachtung der artenschutzrechtlichen Belange bei Straßenbauvorhaben in Schleswig-Holstein ("Bats and road construction – a resource for observance of species conservation interests in connection with road-construction projects in Schleswig-Holstein").
- Runge, Simon & Widdig (2010): Rahmenbedingungen für die Wirksamkeit von Maßnahmen des Artenschutzes bei Infrastrukturvorhaben, FKZ 3507 82 080 ("Parameters for the effectiveness of species conservation measures in connection with infrastructure projects").
- Arbeitshilfe Fledermäuse und Straßenverkehr des Bundesministeriums für Verkehr (draft 2011) "Resource on bats and road traffic, issued by the Federal Ministry of Transport")

Bremen: The state has no guidelines of its own, but it does observe guidelines of other Länder and of the Federal Government.

Hesse: Hesse's ministry of economics has issued a relevant guide, in cooperation with Hesse's state office for roads and transport: "Leitfaden der Erfassungsmethoden und -zeiträume bei faunistischen Untersuchungen zu straßenrechtlichen Eingriffsvorhaben in Hessen" ("Guide to survey methods and intervals in connection with faunal studies of road-law-related projects involving interventions in Hesse").

North Rhine – Westphalia: In April 2011, North-Rhine – Westphalia's state office for road construction (Landesbetrieb Straßenbau NRW) issued a "Planungsleitfaden Artenschutz" ("species conservation planning guide")[26].

Saxony: Saxony's state road-construction administration has prepared a resource for planning and design of bat-crossing aids[27] and introduced it, on a binding basis, for its own sphere of operation. The topics it covers include methods for population surveys and assessment; tips relative to the position, design and size of crossing aids; and measures for improving habitats. In individual cases, the last of these can serve as impacts-mitigation or favourable-conservation-status (FCS) measures pursuant to Art. 34 Federal Nature Conservation Act (BNatSchG) or as conflict-prevention or continuous-ecological-functionality (CEF) measures pursuant to Art. 44 BNatSchG. Increasingly, plan approvals and pertinent court rulings have been requiring supporting monitoring for checking the proper function of species-oriented measures and for keeping track of population development.

Saxony-Anhalt: The state does not have binding state-wide guidelines.

Thuringia: In general, Thuringian authorities and planning agencies apply the relevant guidelines issued, or disseminated in draft form, by the Forschungsgesellschaft für Straßen- und Verkehrswegebau (association for research related to road and traffic-infrastructure construction).

During the period covered by the report, Thuringia's State institute for the environment and geology (Thüringer Landesanstalt für Umwelt und Geologie – TLUG) prepared a concept entitled "Priority measures for eliminating the fragmentation effects of traffic infrastructure and of structures in biotope networks (defragmentation) in Thuringia" ("Vordringliche Maßnahmen zur Beseitigung von Zerschneidungswirkungen von Verkehrswegen und Bauwerken im Biotopverbund (Entschneidung) in Thüringen")[28]. The indicator species used in the concept include forest-dwelling mammals, fish and otters and bats (lesser horseshoe bat, barbastelle and greater mouse-eared bat). In connection with the preparation of the concept, those roosts were identified that would likely be at risk of suffering

[25] http://www.verkehr.sachsen.de/download/verkehr/bq_SMWA_Querungshilfen_WEB.pdf

[26] http://www.strassen.nrw.de/_down/pub_leitfaden_artenschutz.pdf

[27] http://www.verkehr.sachsen.de/download/verkehr/bq_SMWA_Querungshilfen_WEB.pdf

[28] https://www.thueringen.de/imperia/md/content/tlug/abt3/biotopverbund/wiedervernetzung_th__ringen_2010_neu3.pdf

fragmentation impacts and collision risks via traffic. In addition, corridors were defined for measures to create biotope networks designed to ensure that these species' key areas of occurrence remain interconnected. In 2014, the fragmentation effects are to be verified / reviewed on location.

15.17 MOP 6 Resolution No. 6.15: Impact on Bat Populations of the Use of Antiparasitic Drugs for Livestock

Information provided by the Länder:

Bavaria: In conventional livestock operations, livestock kept in pastures is regularly treated for parasites. Projects that promote grazing for nature-conservation reasons often make use of livestock from organic farms. Normally, during the grazing season, such livestock receive little or no anti-parasitic treatments.

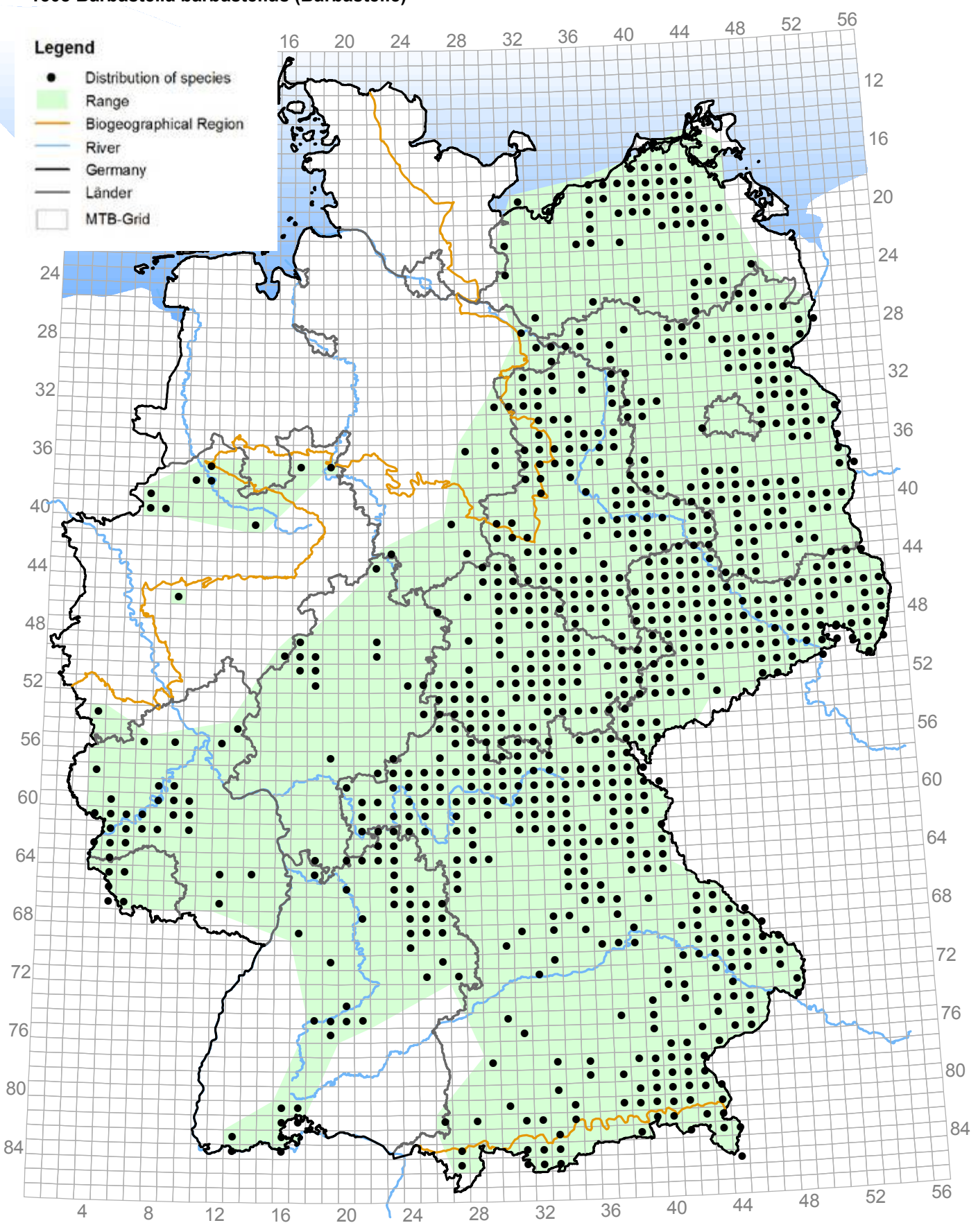
Hesse: No regulations have yet been issued, but this topic is being discussed by relevant bodies.

Annex to the report Bat population and range maps from the 2013 national report under the Habitats Directive.

Distribution and Range Maps of Species of the Habitats Directive

State December 2013

1308 Barbastella barbastellus (Barbastelle)



Federal Agency for Nature Conservation

Geobasisdaten (c) GeoBasis-DE / BKG

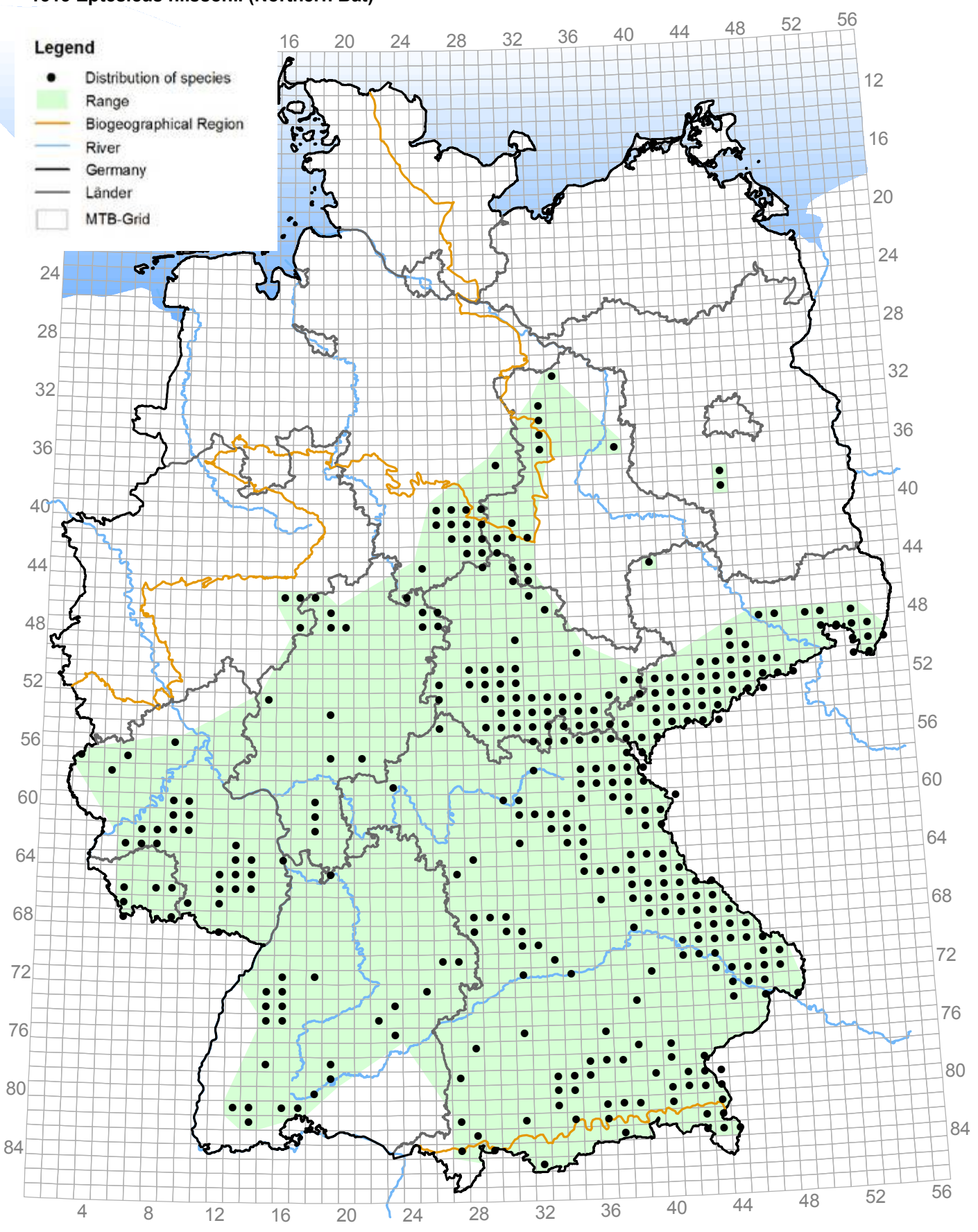
Source: Nationaler FFH-Bericht 2013

0 50 100 Kilometer

Distribution and Range Maps of Species of the Habitats Directive

State December 2013

1313 Eptesicus nilssonii (Northern Bat)



Geobasisdaten (c) GeoBasis-DE / BKG

Source: Nationaler FFH-Bericht 2013

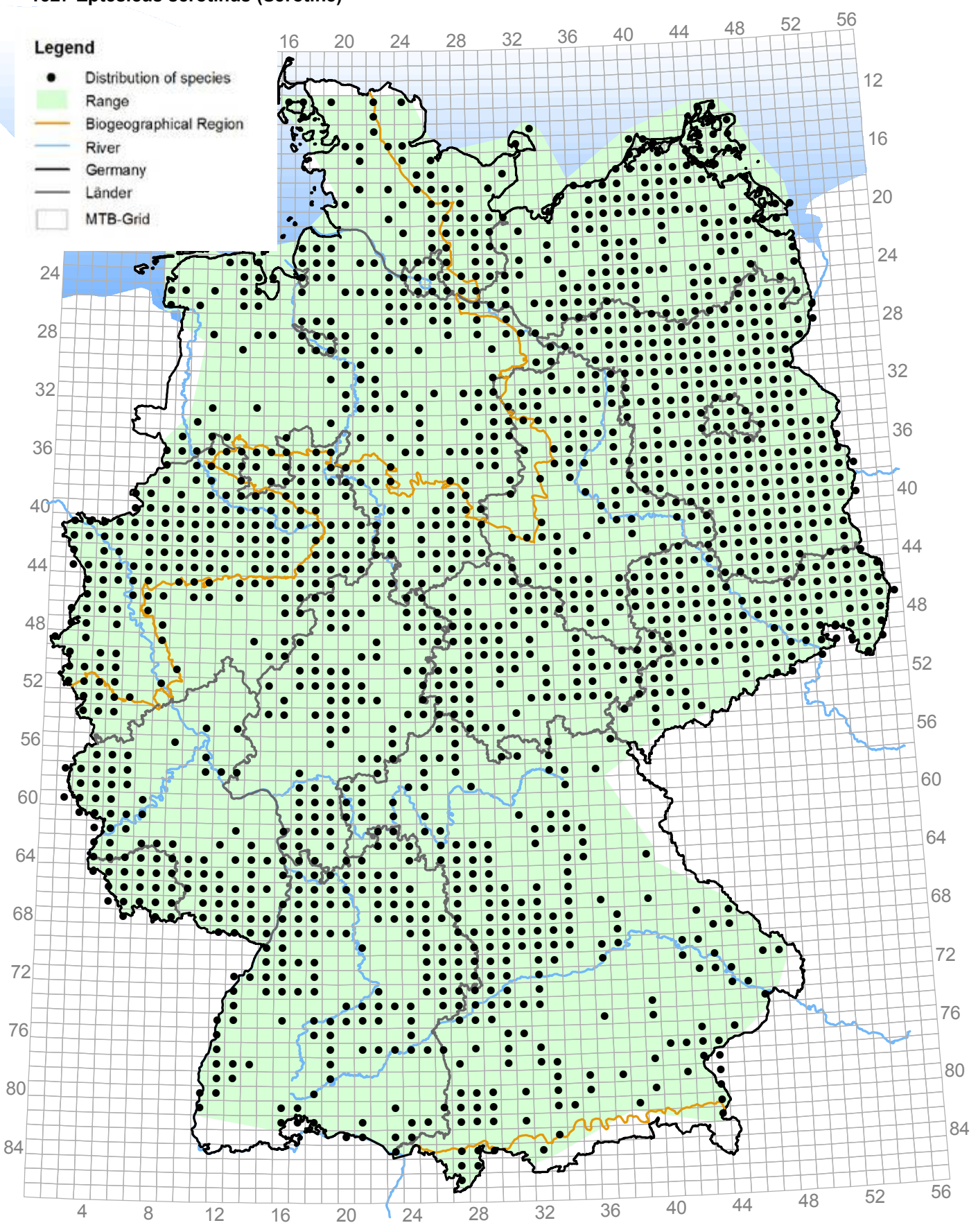
0 50 100 Kilometer

Federal Agency for Nature Conservation

Distribution and Range Maps of Species of the Habitats Directive

State December 2013

1327 Eptesicus serotinus (Serotine)



Federal Agency for Nature Conservation

Geobasisdaten (c) GeoBasis-DE / BKG

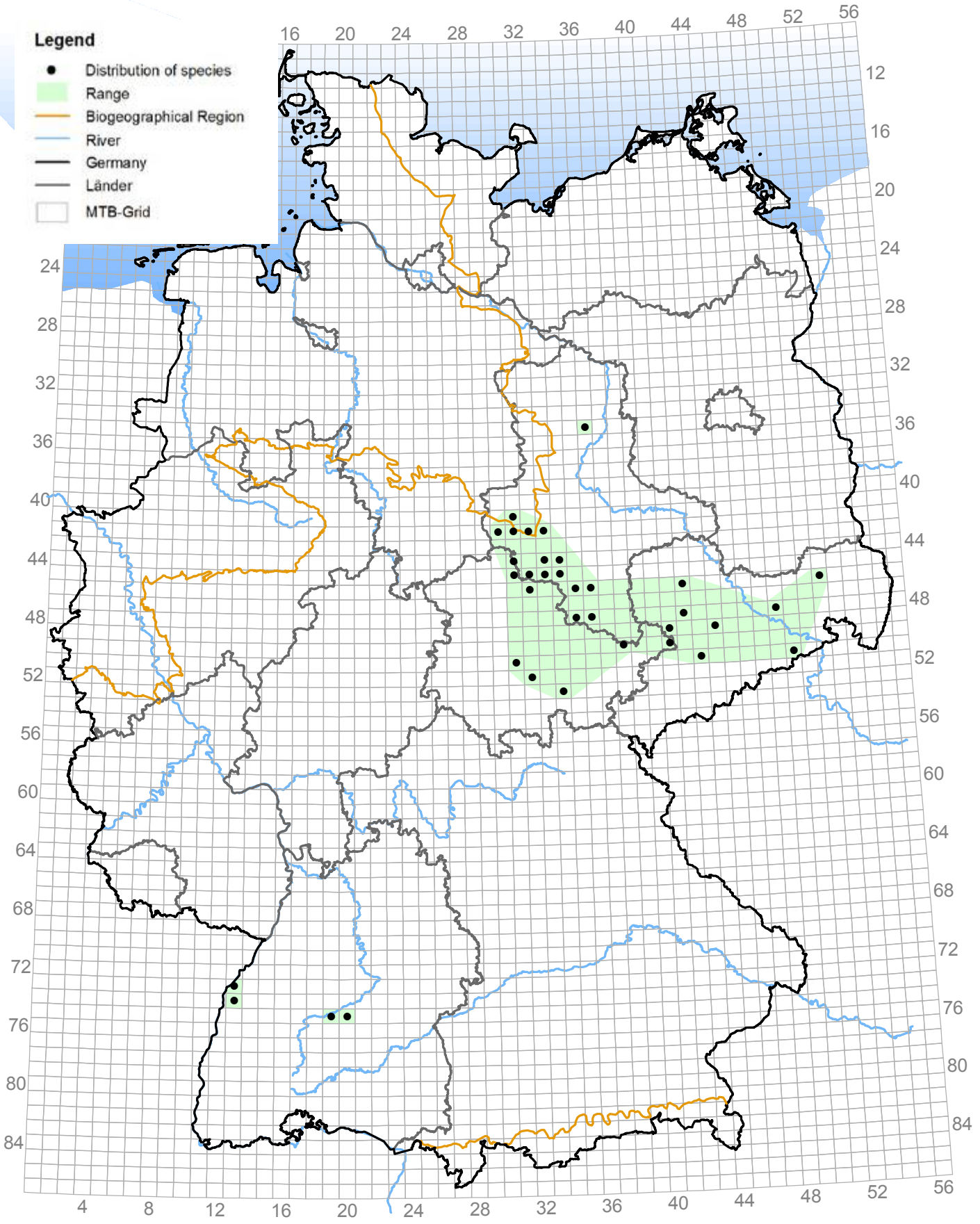
Source: Nationaler FFH-Bericht 2013

0 50 100 Kilometer

Distribution and Range Maps of Species of the Habitats Directive

State December 2013

5003 Myotis alcathoe (Alcathoe Whiskered Bat)



Geobasisdaten (c) GeoBasis-DE / BKG

Source: Nationaler FFH-Bericht 2013

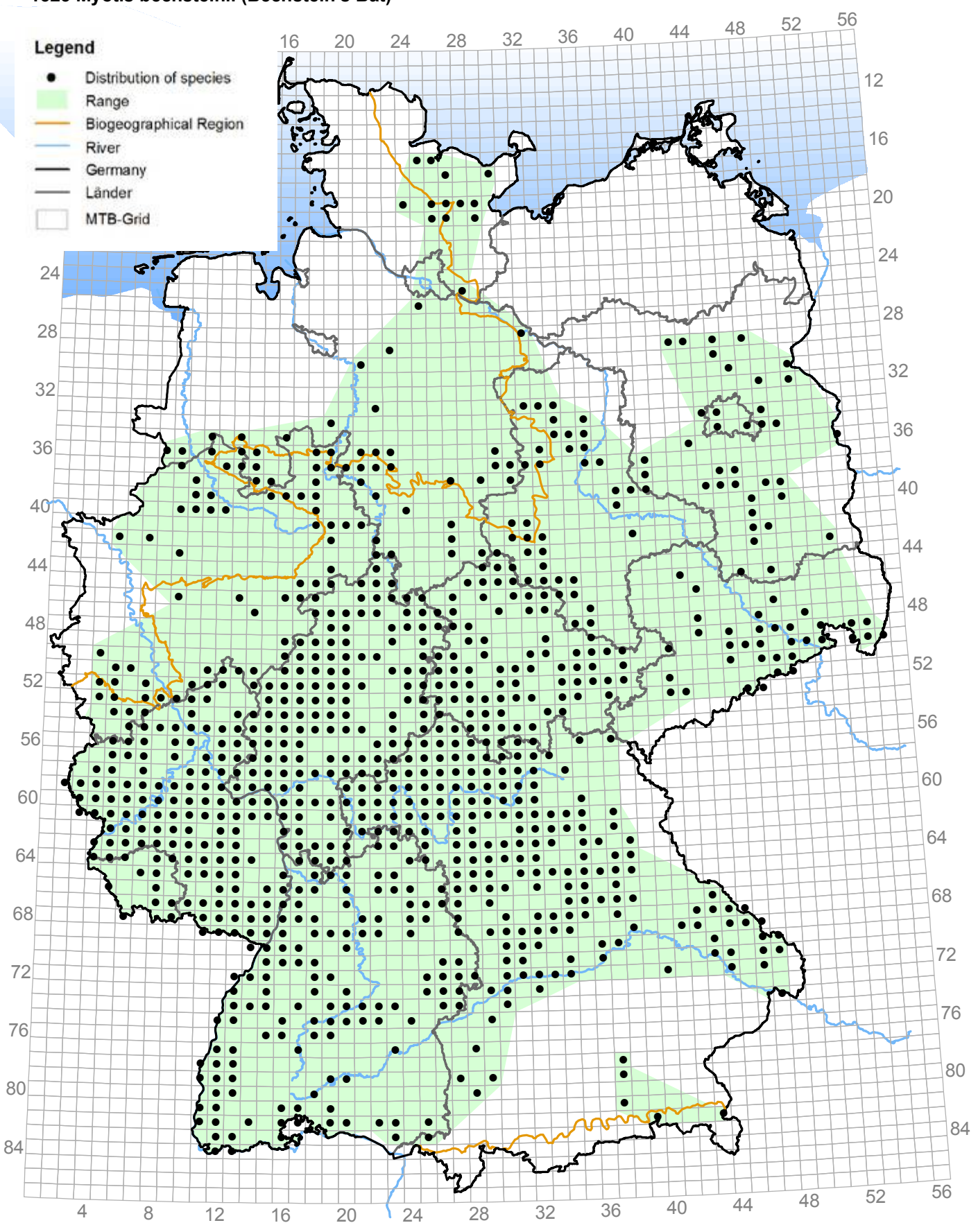
0 50 100 Kilometer

Federal Agency for Nature Conservation

Distribution and Range Maps of Species of the Habitats Directive

State December 2013

1323 Myotis bechsteinii (Bechstein's Bat)



Federal Agency for Nature Conservation

Geobasisdaten (c) GeoBasis-DE / BKG

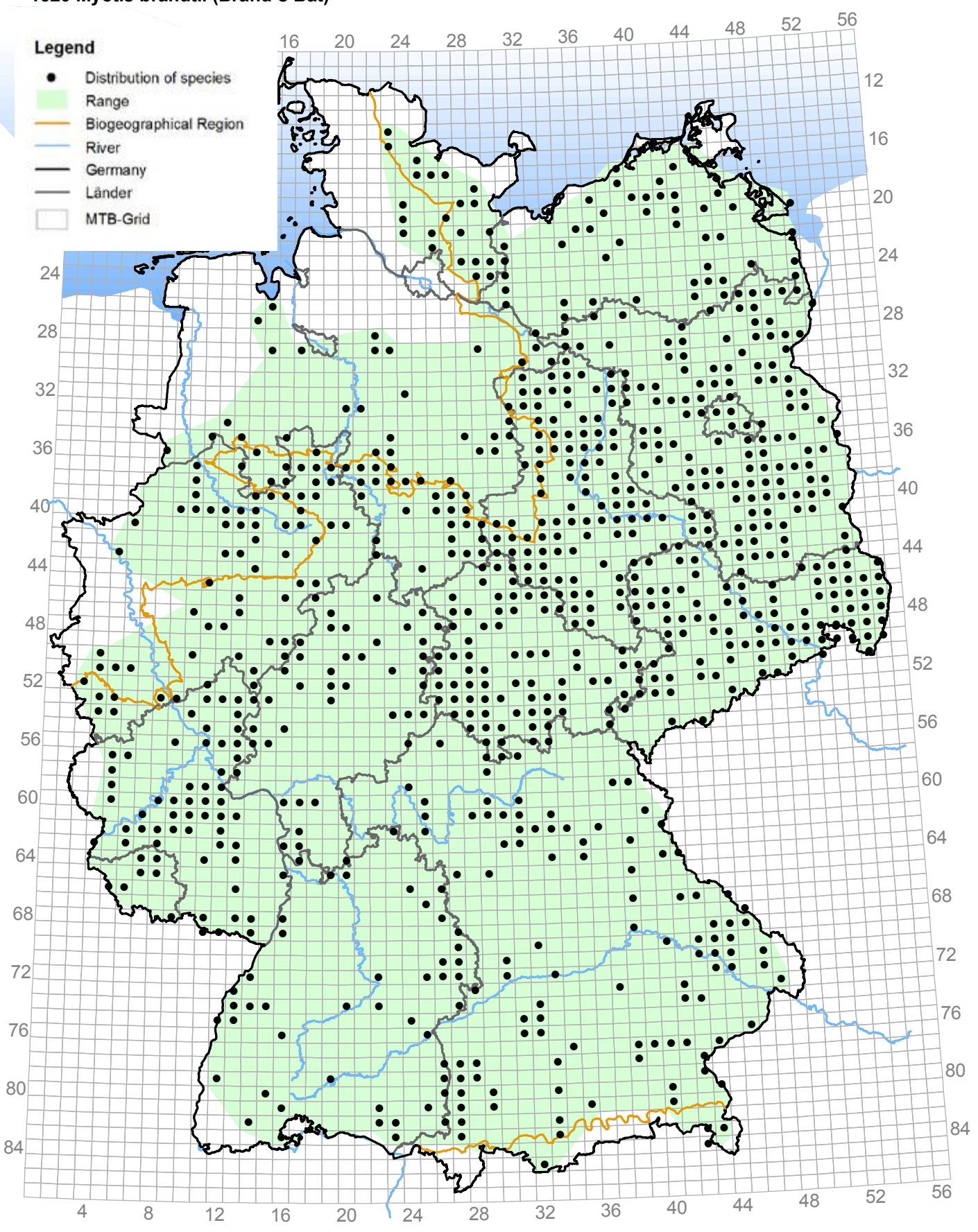
Source: Nationaler FFH-Bericht 2013

0 50 100 Kilometer

Distribution and Range Maps of Species of the Habitats Directive

State December 2013

1320 Myotis brandtii (Brand´s Bat)



Federal Agency for Nature Conservation

Geobasisdaten (c) GeoBasis-DE / BKG

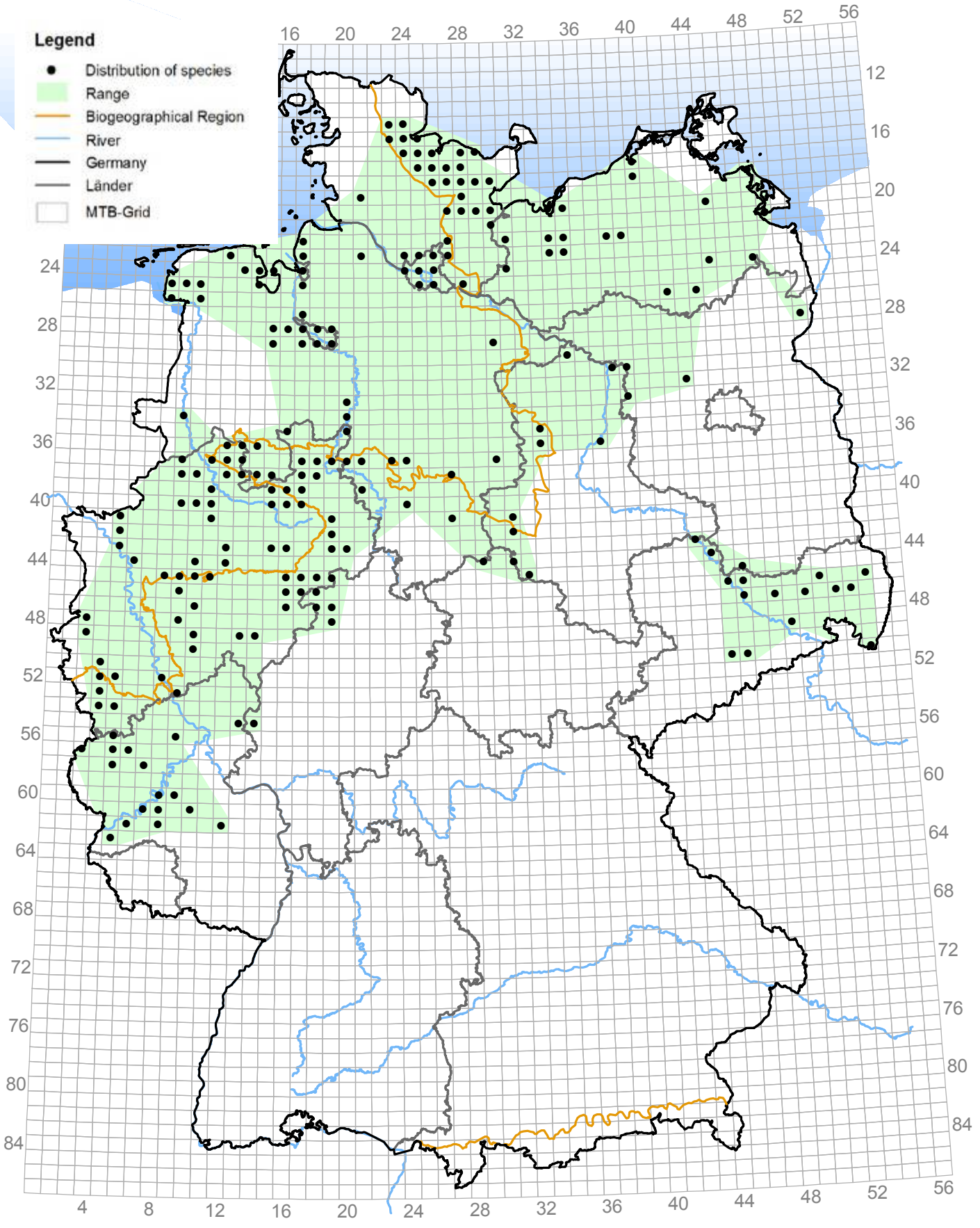
Source: Nationaler FFH-Bericht 2013

0 50 100 Kilometer

Distribution and Range Maps of Species of the Habitats Directive

State December 2013

1318 Myotis dasycneme (Pond Bat)



Federal Agency for Nature Conservation

Geobasisdaten (c) GeoBasis-DE / BKG

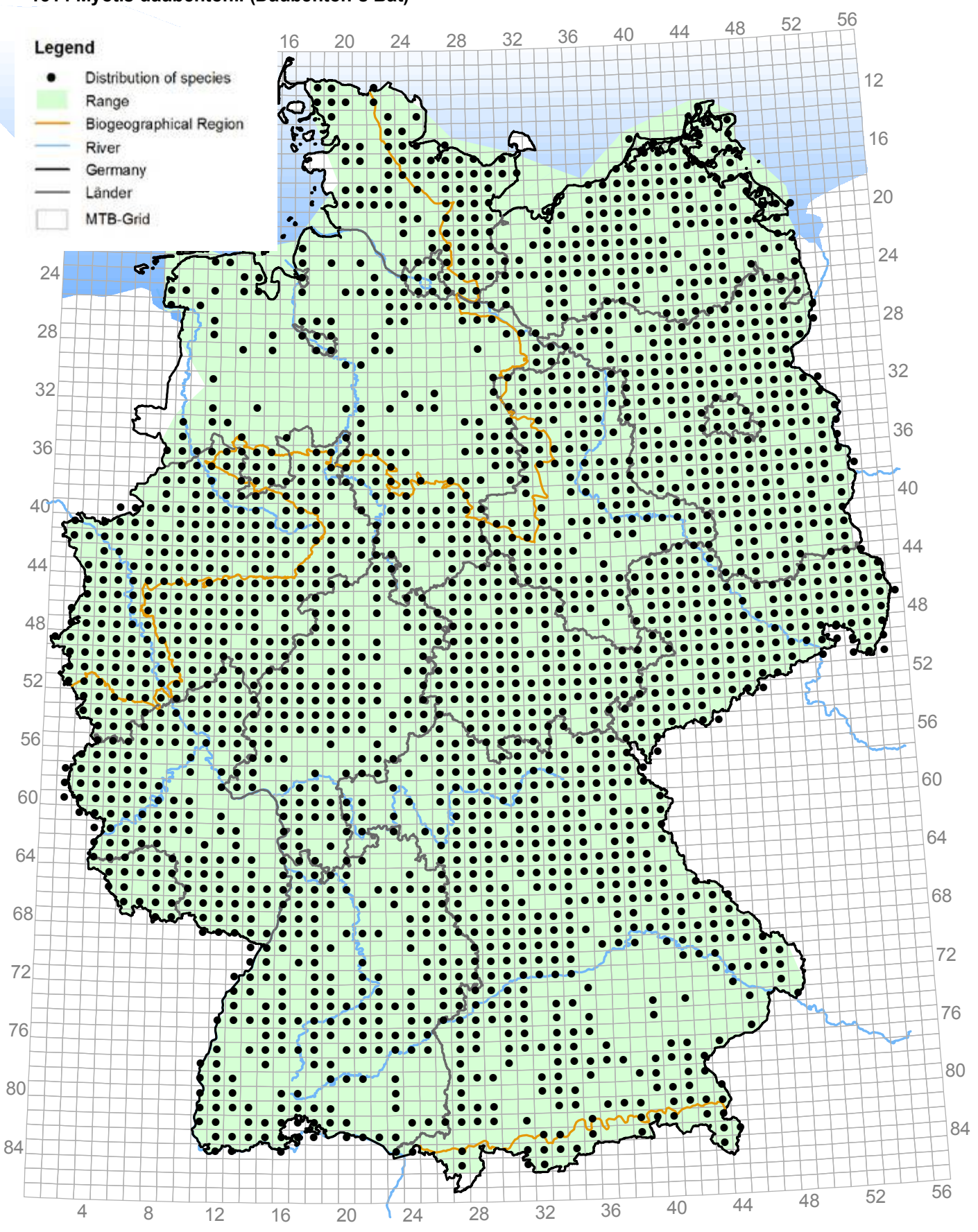
Source: Nationaler FFH-Bericht 2013

0 50 100 Kilometer

Distribution and Range Maps of Species of the Habitats Directive

State December 2013

1314 Myotis daubentonii (Daubenton´s Bat)



Federal Agency for Nature Conservation

Geobasisdaten (c) GeoBasis-DE / BKG

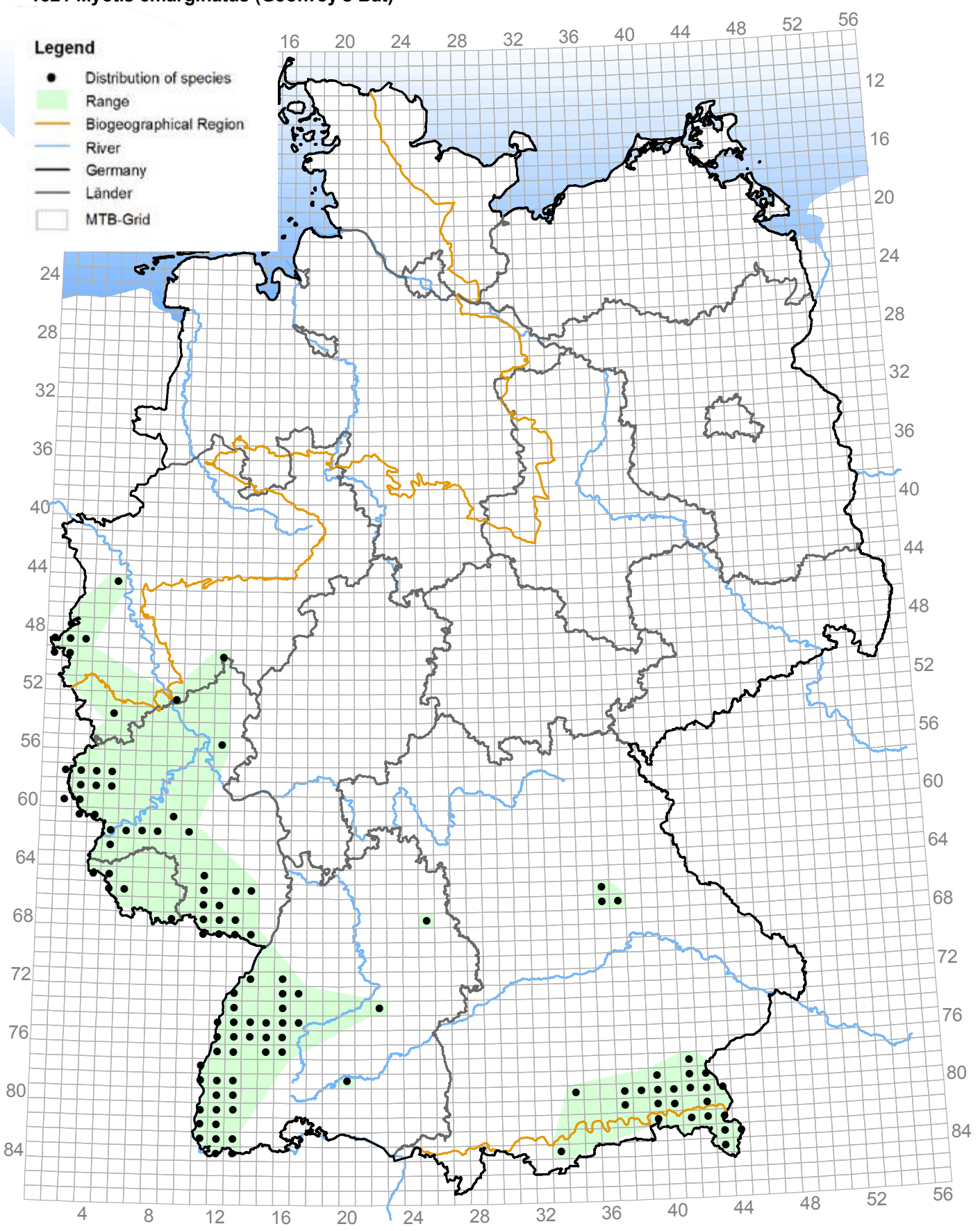
Source: Nationaler FFH-Bericht 2013

0 50 100 Kilometer

Distribution and Range Maps of Species of the Habitats Directive

State December 2013

1321 Myotis emarginatus (Geoffroy's Bat)



Federal Agency for Nature Conservation

Geobasisdaten (c) GeoBasis-DE / BKG

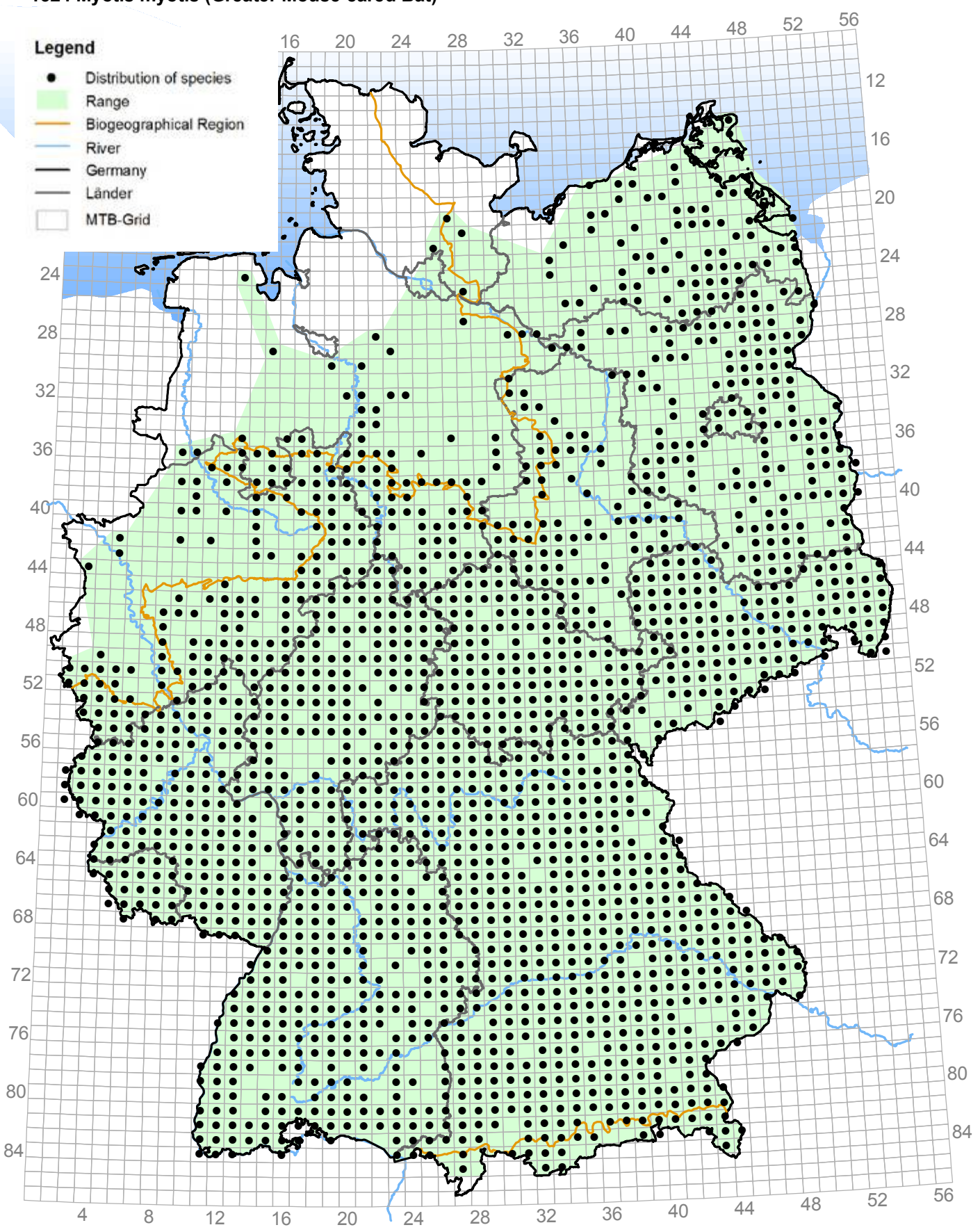
Source: Nationaler FFH-Bericht 2013

0 50 100 Kilometer

Distribution and Range Maps of Species of the Habitats Directive

State December 2013

1324 Myotis myotis (Greater Mouse-eared Bat)



Federal Agency for Nature Conservation

Geobasisdaten (c) GeoBasis-DE / BKG

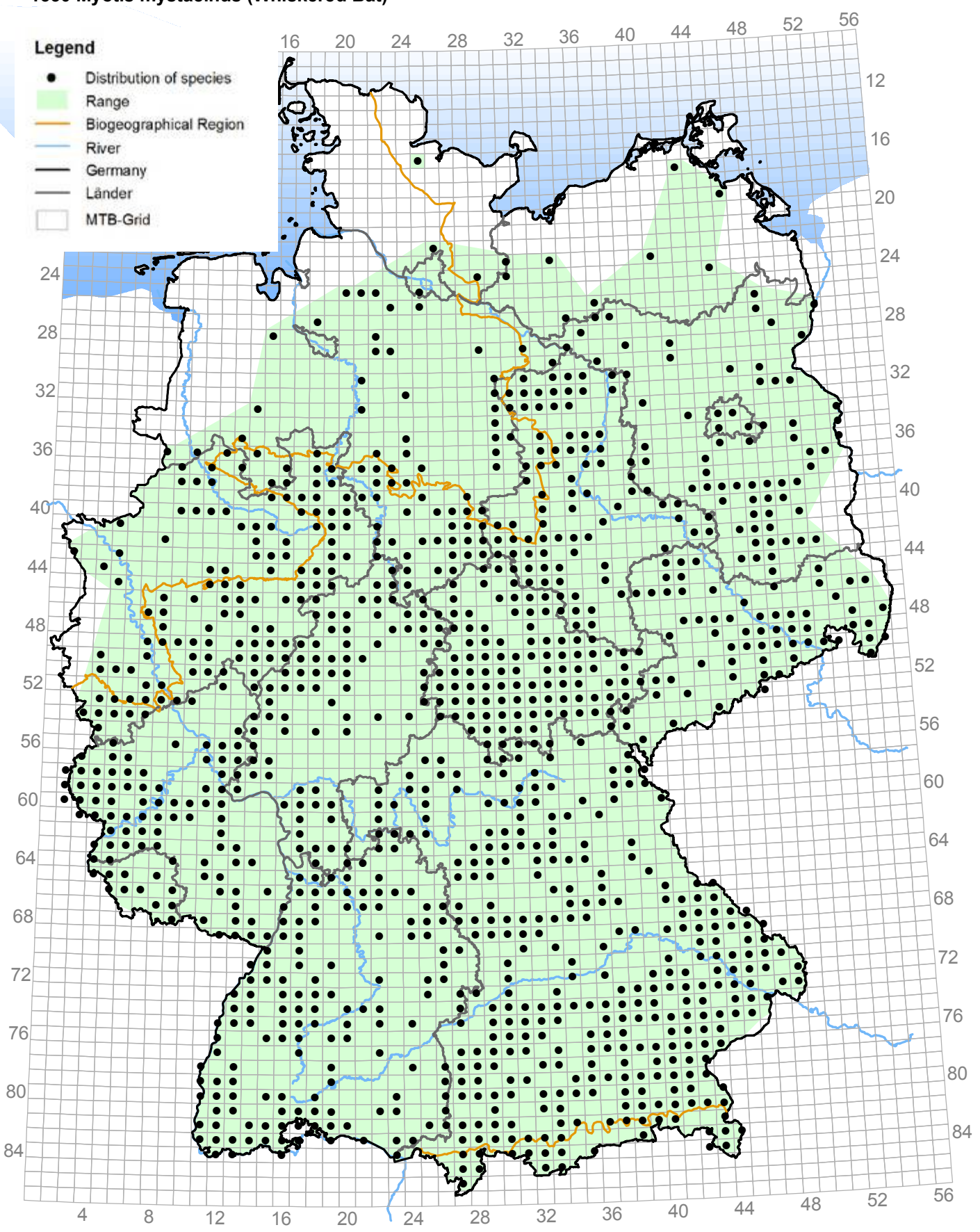
Source: Nationaler FFH-Bericht 2013

0 50 100 Kilometer

Distribution and Range Maps of Species of the Habitats Directive

State December 2013

1330 Myotis mystacinus (Whiskered Bat)



Federal Agency for Nature Conservation

Geobasisdaten (c) GeoBasis-DE / BKG

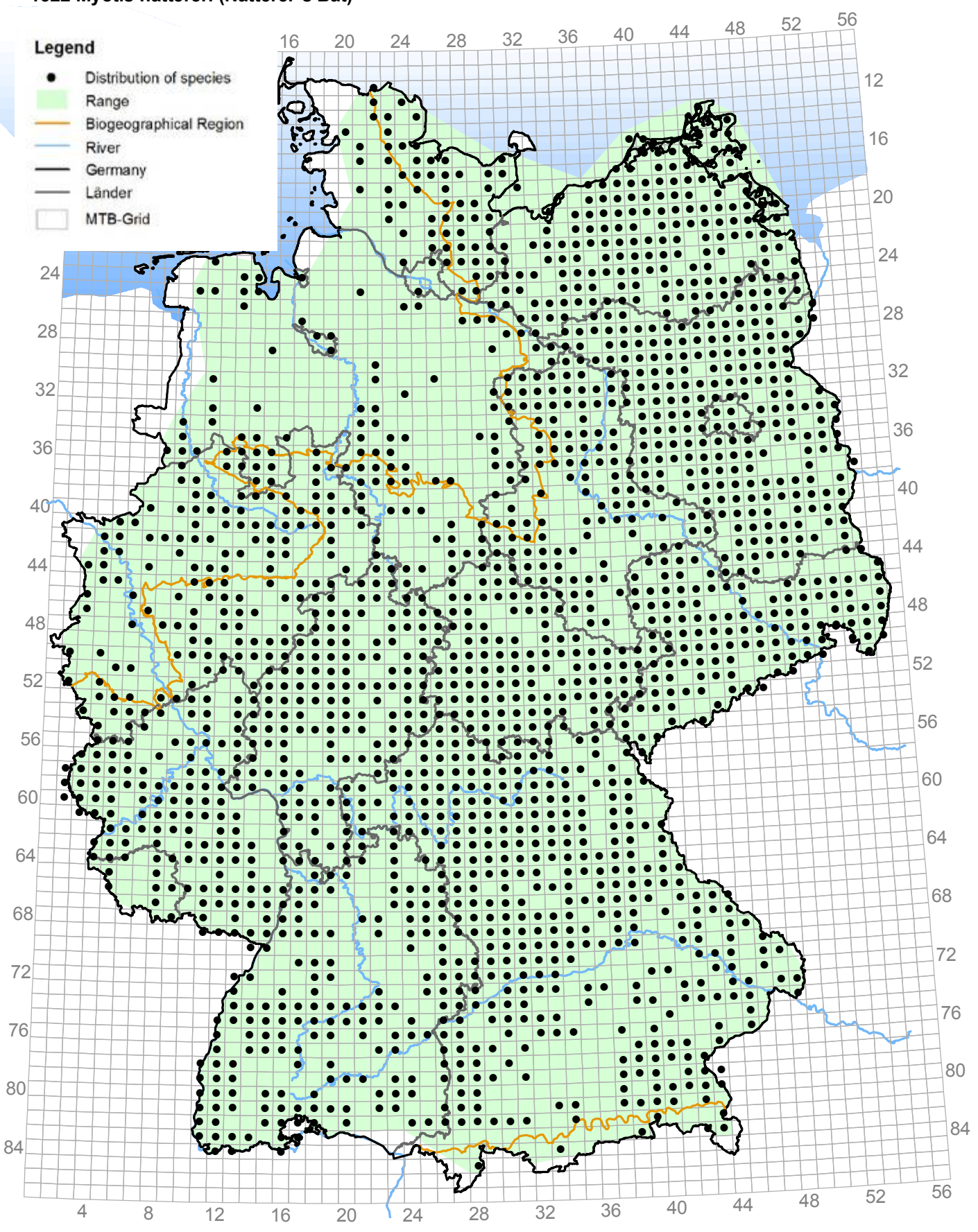
Source: Nationaler FFH-Bericht 2013

0 50 100 Kilometer

Distribution and Range Maps of Species of the Habitats Directive

State December 2013

1322 Myotis nattereri (Natterer´s Bat)



Federal Agency for Nature Conservation

Geobasisdaten (c) GeoBasis-DE / BKG

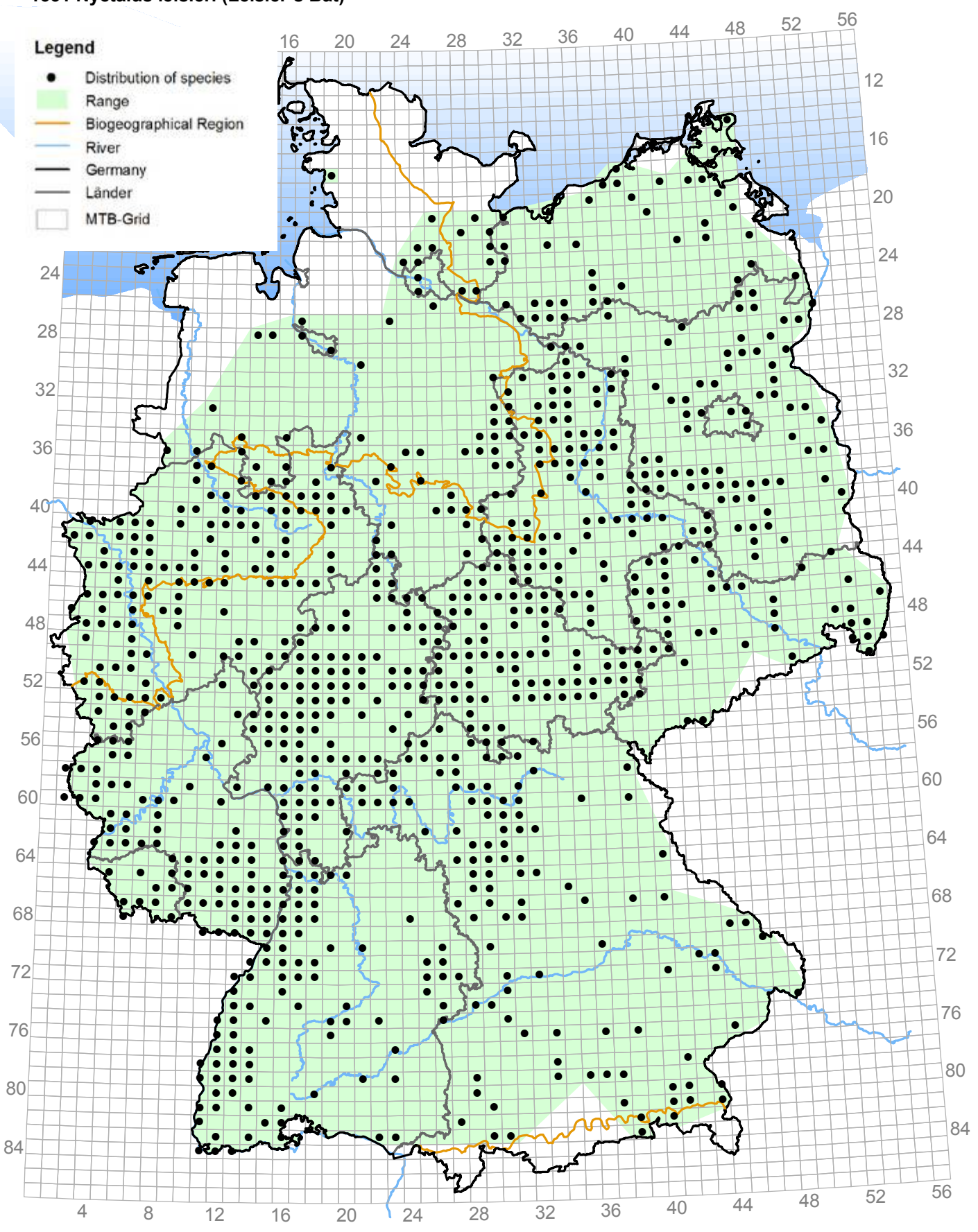
Source: Nationaler FFH-Bericht 2013

0 50 100 Kilometer

Distribution and Range Maps of Species of the Habitats Directive

State December 2013

1331 Nyctalus leisleri (Leisler´s Bat)



Geobasisdaten (c) GeoBasis-DE / BKG

Source: Nationaler FFH-Bericht 2013

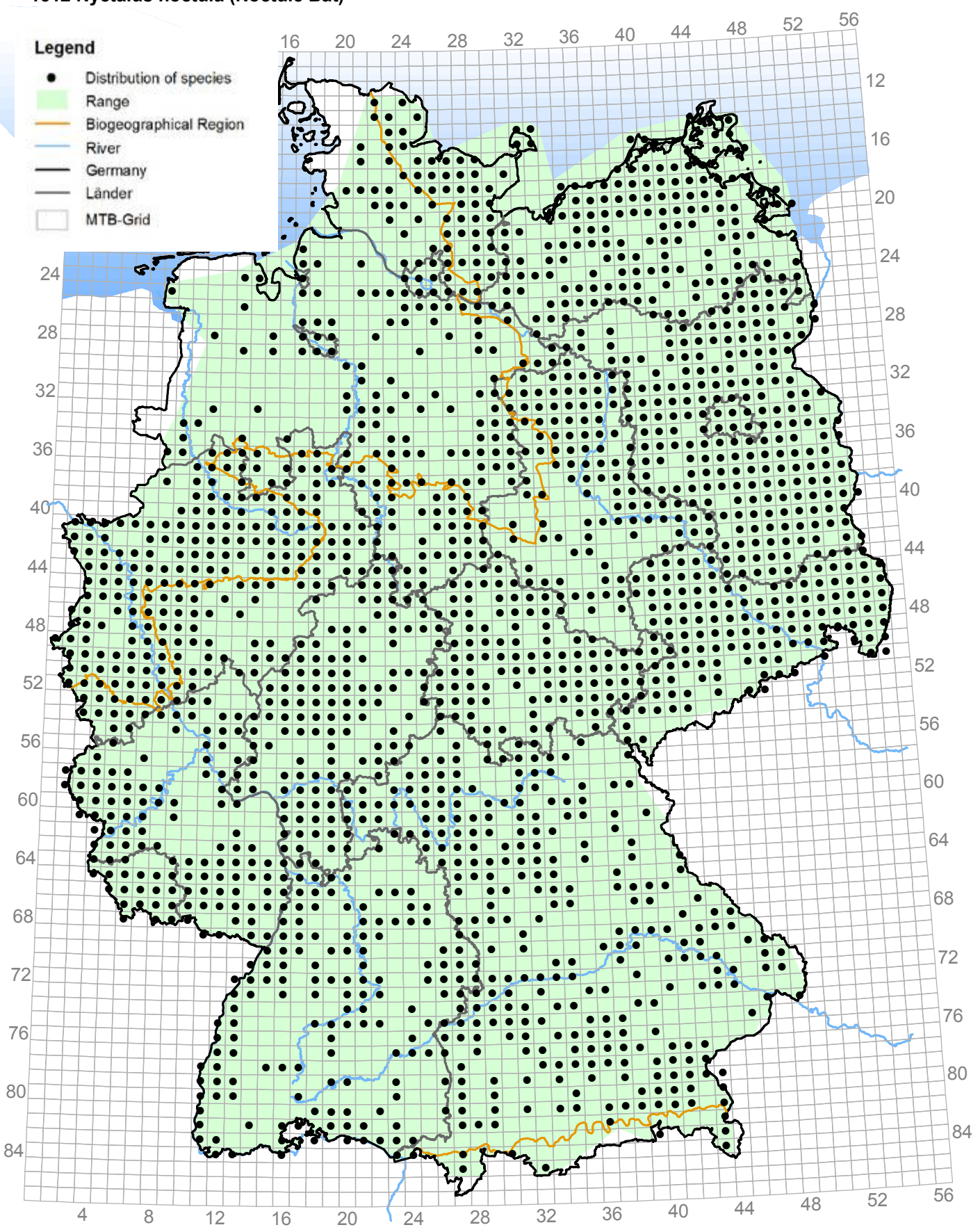
0 50 100 Kilometer

Federal Agency for Nature Conservation

Distribution and Range Maps of Species of the Habitats Directive

State December 2013

1312 Nyctalus noctula (Noctule Bat)



Federal Agency for Nature Conservation

Geobasisdaten (c) GeoBasis-DE / BKG

Source: Nationaler FFH-Bericht 2013

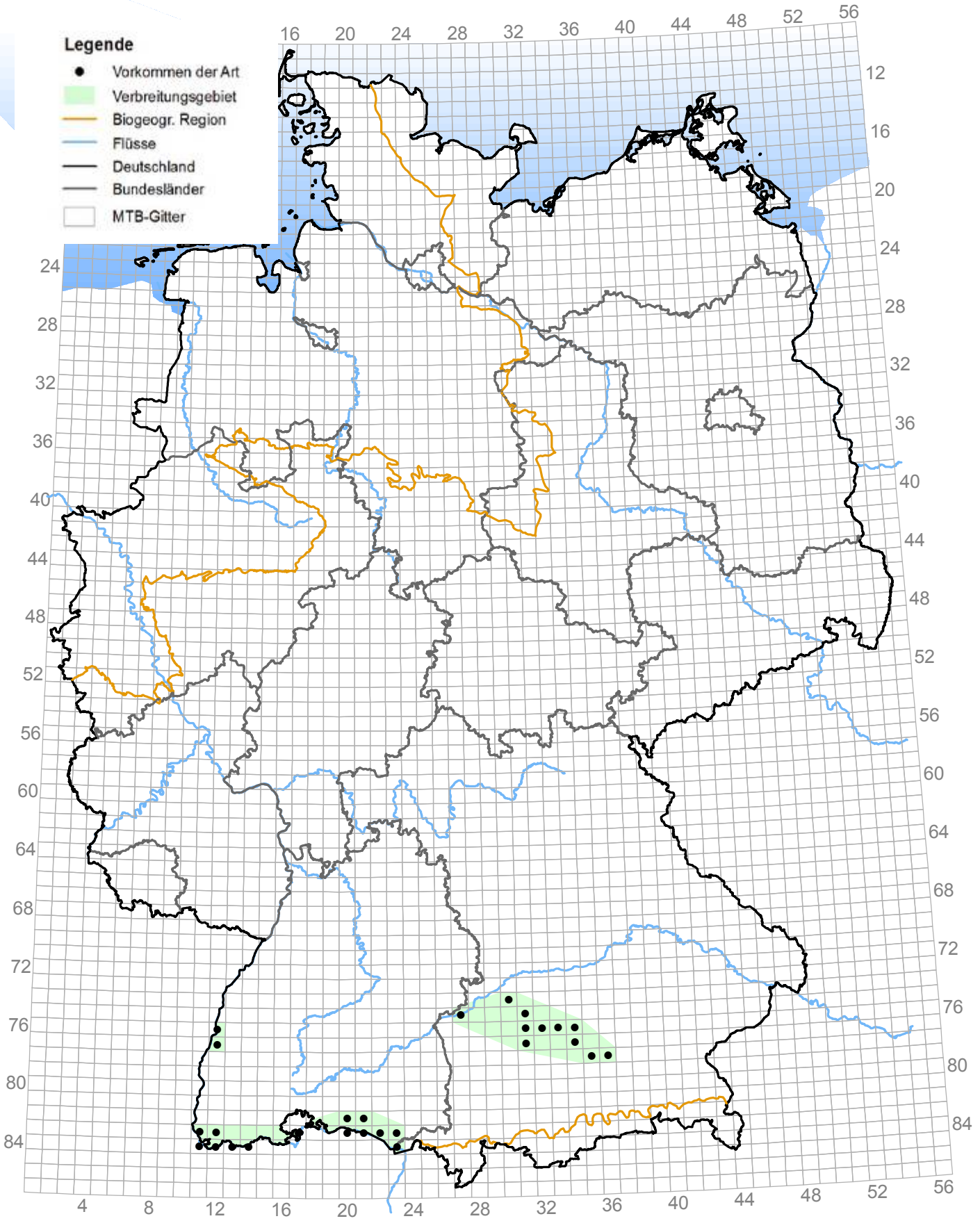
0 50 100 Kilometer

Kombinierte Vorkommens- und Verbreitungskarte der Pflanzen- und Tierarten der FFH-Richtlinie

Stand: Dezember 2013

Berichtsjahr: 2013

2016 Pipistrellus kuhlii (Weißrandfledermaus)



Bundesamt für Naturschutz

Geobasisdaten (c) GeoBasis-DE / BKG

Quelle: Nationaler FFH-Bericht 2013

Datengrundlagen: Verbreitungsdaten der Bundesländer und des BfN

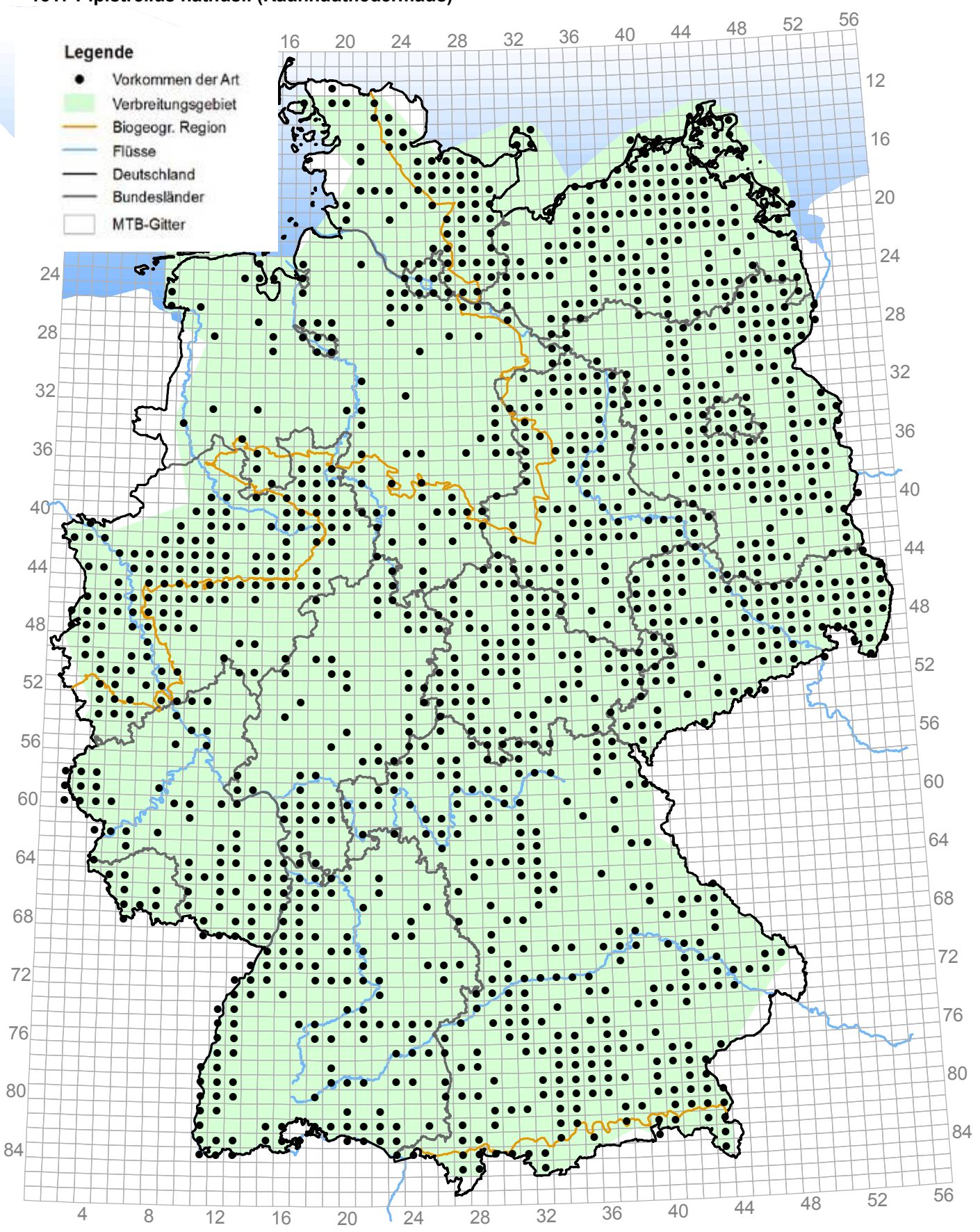
0 50 100 Kilometer

Kombinierte Vorkommens- und Verbreitungskarte der Pflanzen- und Tierarten der FFH-Richtlinie

Stand: Dezember 2013

Berichtsjahr: 2013

1317 Pipistrellus nathusii (Rauhhautfledermaus)



Bundesamt für Naturschutz

Geobasisdaten (c) GeoBasis-DE / BKG

0 50 100 Kilometer

Quelle: Nationaler FFH-Bericht 2013

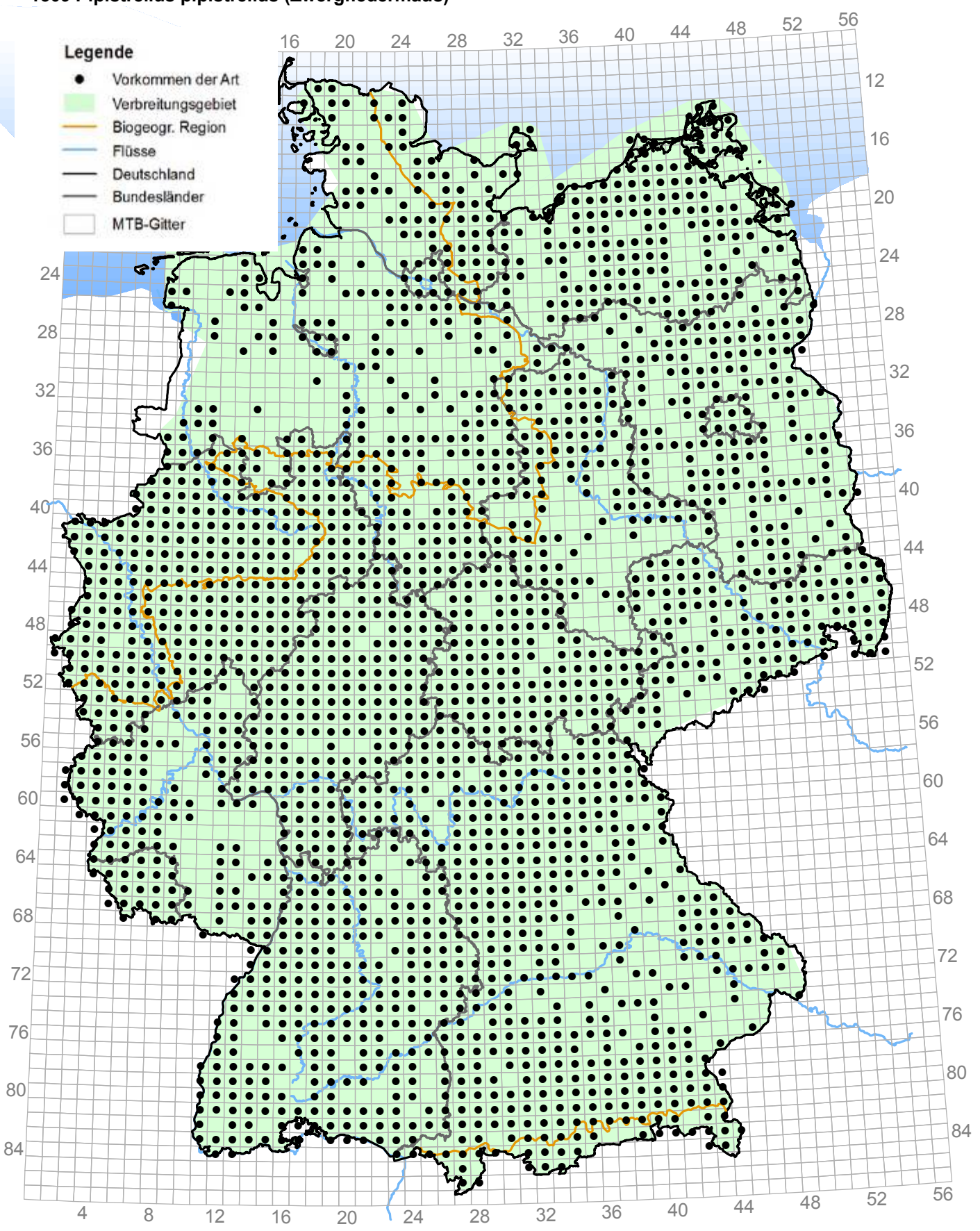
Datengrundlagen: Verbreitungsdaten der Bundesländer und des BfN

Kombinierte Vorkommens- und Verbreitungskarte der Pflanzen- und Tierarten der FFH-Richtlinie

Stand: Dezember 2013

Berichtsjahr: 2013

1309 Pipistrellus pipistrellus (Zwergfledermaus)



Bundesamt für Naturschutz

Geobasisdaten (c) GeoBasis-DE / BKG

0 50 100 Kilometer

Quelle: Nationaler FFH-Bericht 2013

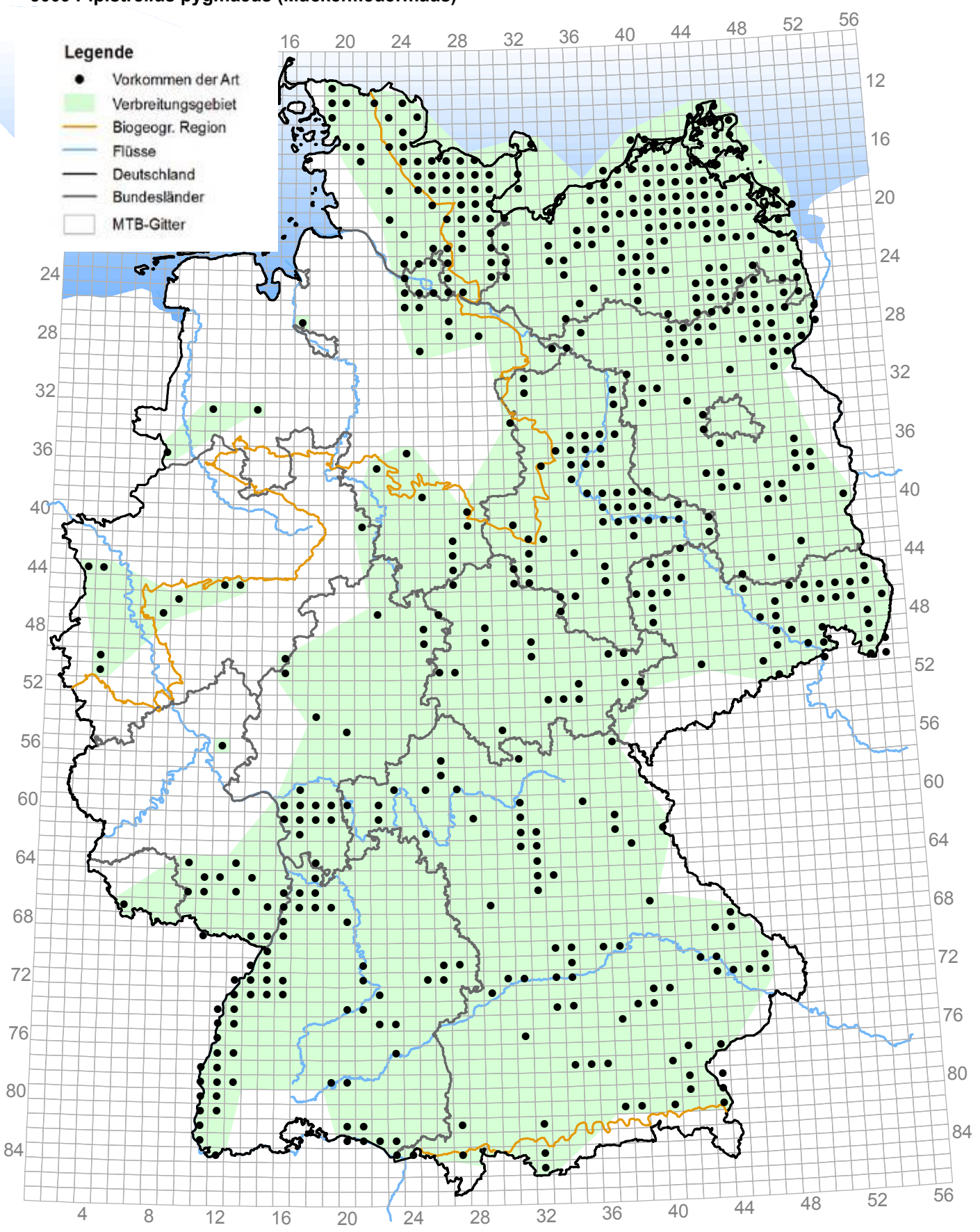
Datengrundlagen: Verbreitungsdaten der Bundesländer und des BfN

Kombinierte Vorkommens- und Verbreitungskarte der Pflanzen- und Tierarten der FFH-Richtlinie

Stand: Dezember 2013

Berichtsjahr: 2013

5009 Pipistrellus pygmaeus (Mückenfledermaus)



Bundesamt für Naturschutz

Geobasisdaten (c) GeoBasis-DE / BKG

Quelle: Nationaler FFH-Bericht 2013

Datengrundlagen: Verbreitungsdaten der Bundesländer und des BfN

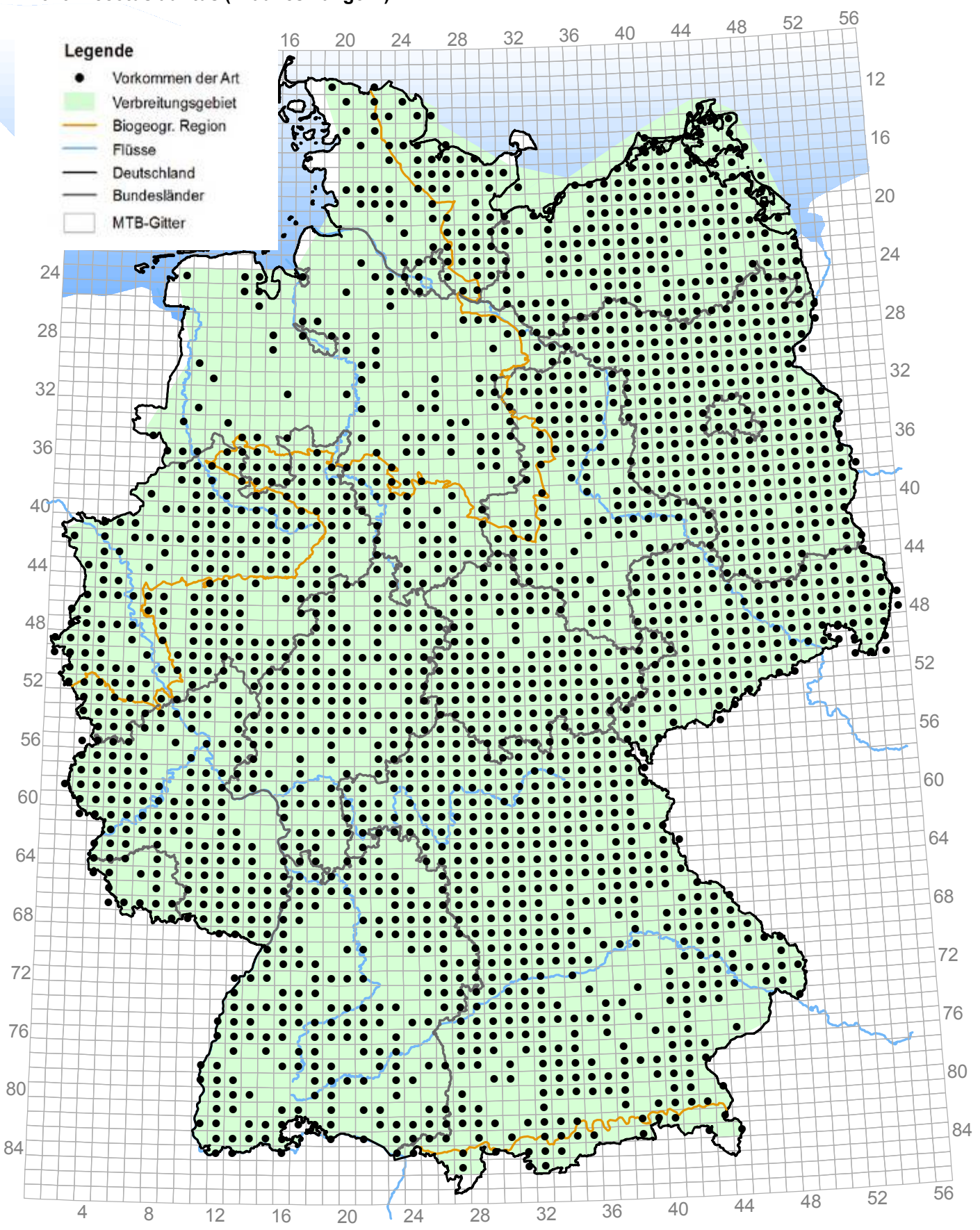
0 50 100 Kilometer

Kombinierte Vorkommens- und Verbreitungskarte der Pflanzen- und Tierarten der FFH-Richtlinie

Stand: Dezember 2013

Berichtsjahr: 2013

1326 Plecotus auritus (Braunes Langohr)



Bundesamt für Naturschutz

Geobasisdaten (c) GeoBasis-DE / BKG

0 50 100 Kilometer

Quelle: Nationaler FFH-Bericht 2013

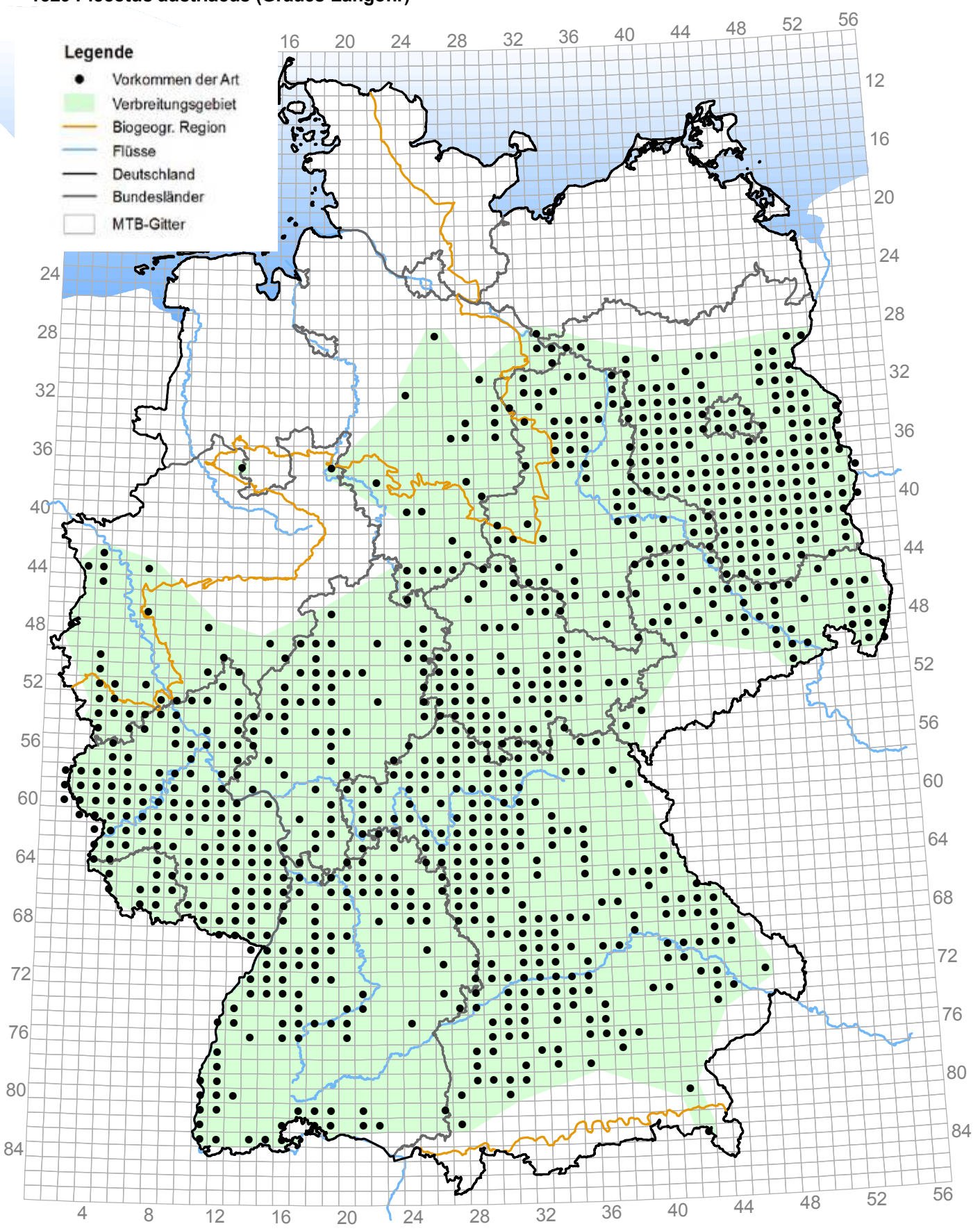
Datengrundlagen: Verbreitungsdaten der Bundesländer und des BfN

Kombinierte Vorkommens- und Verbreitungskarte der Pflanzen- und Tierarten der FFH-Richtlinie

Stand: Dezember 2013

Berichtsjahr: 2013

1329 Plecotus austriacus (Graues Langohr)



Bundesamt für Naturschutz

Geobasisdaten (c) GeoBasis-DE / BKG

Quelle: Nationaler FFH-Bericht 2013

Datengrundlagen: Verbreitungsdaten der Bundesländer und des BfN

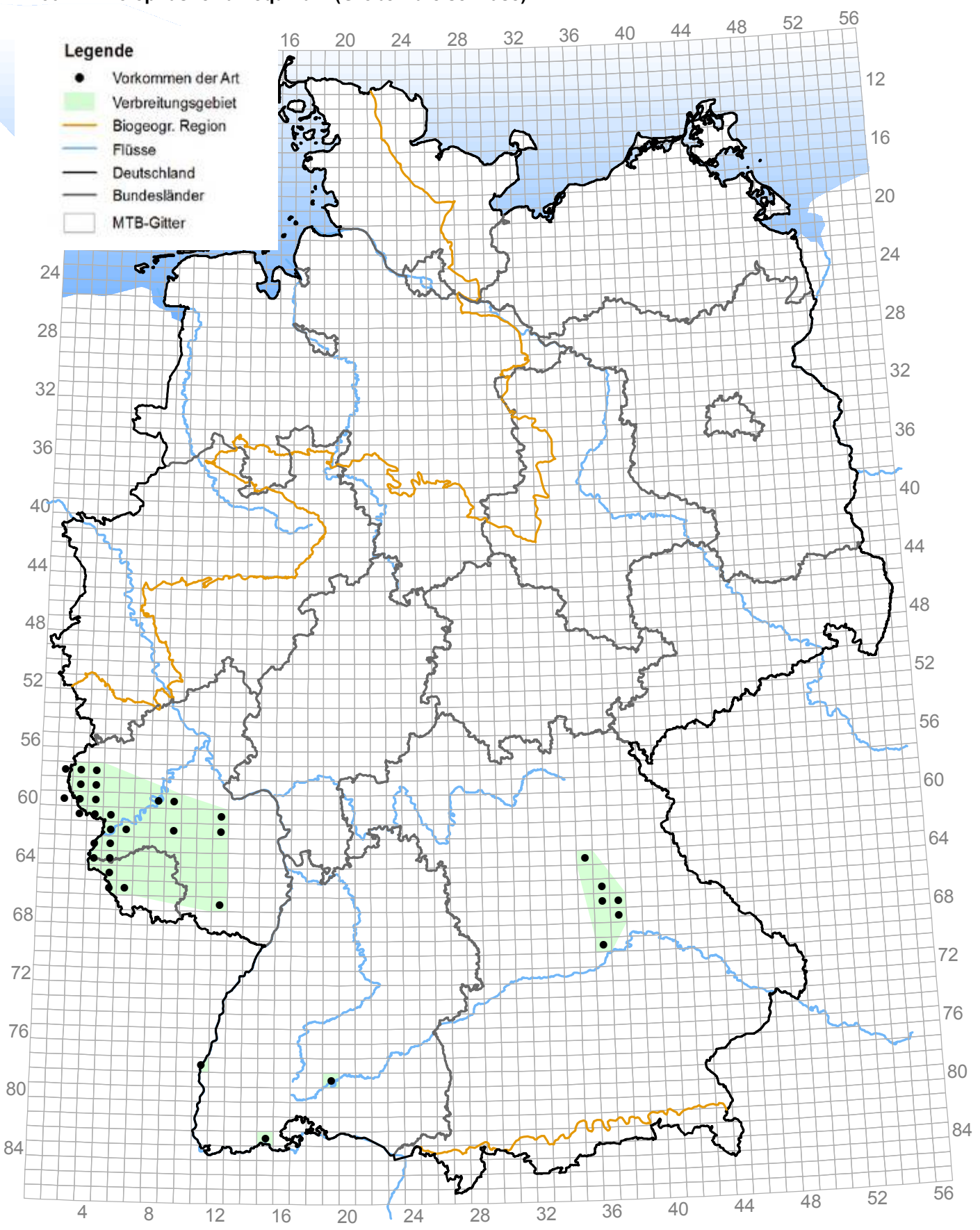
0 50 100 Kilometer

Kombinierte Vorkommens- und Verbreitungskarte der Pflanzen- und Tierarten der FFH-Richtlinie

Stand: Dezember 2013

Berichtsjahr: 2013

1304 Rhinolophus ferrumequinum (Große Hufeisennase)



Bundesamt für Naturschutz

Geobasisdaten (c) GeoBasis-DE / BKG

Quelle: Nationaler FFH-Bericht 2013

Datengrundlagen: Verbreitungsdaten der Bundesländer und des BfN

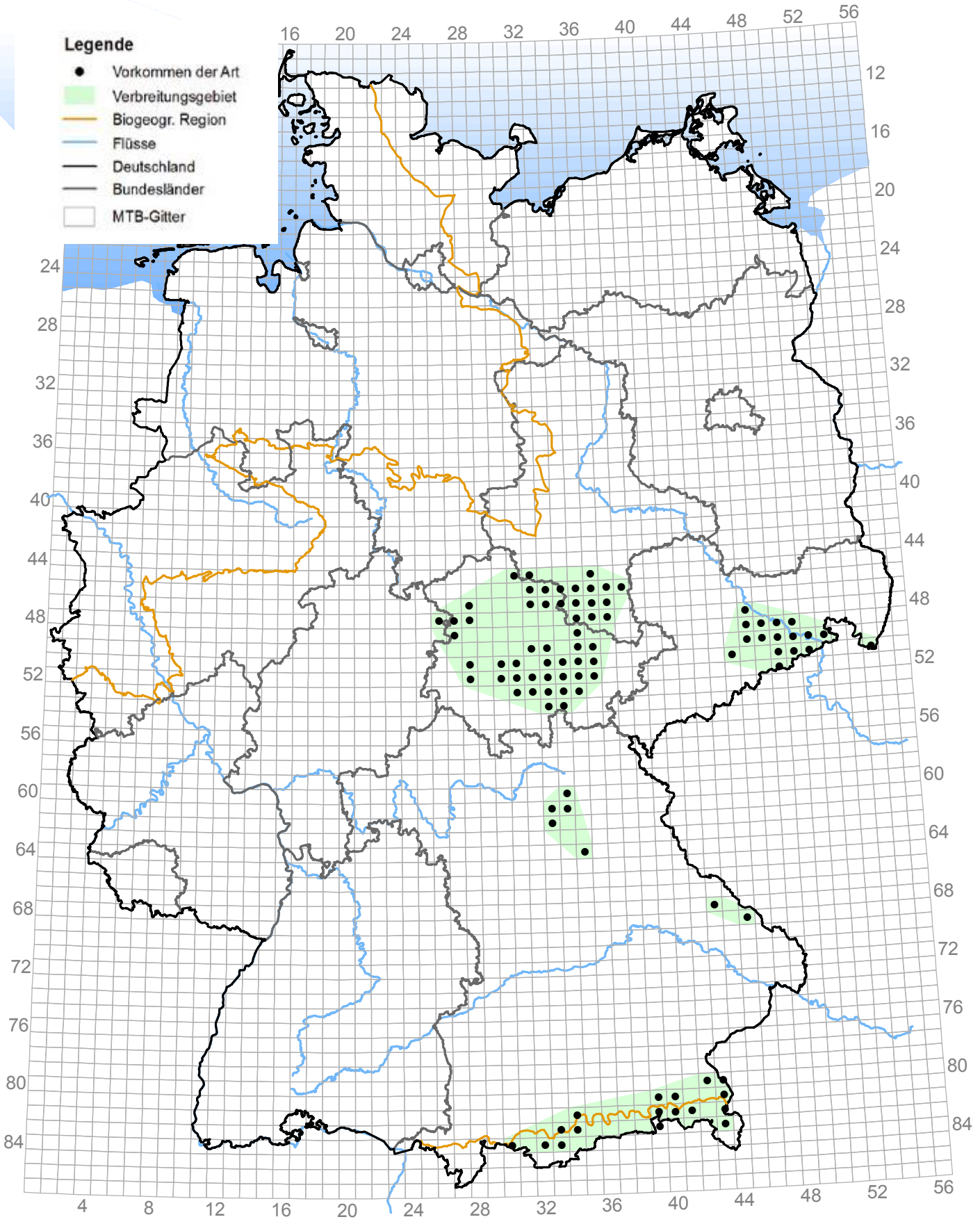
0 50 100 Kilometer

Kombinierte Vorkommens- und Verbreitungskarte der Pflanzen- und Tierarten der FFH-Richtlinie

Stand: Dezember 2013

Berichtsjahr: 2013

1303 Rhinolophus hipposideros (Kleine Hufeisennase)



Bundesamt für Naturschutz

Geobasisdaten (c) GeoBasis-DE / BKG

0 50 100 Kilometer

Quelle: Nationaler FFH-Bericht 2013

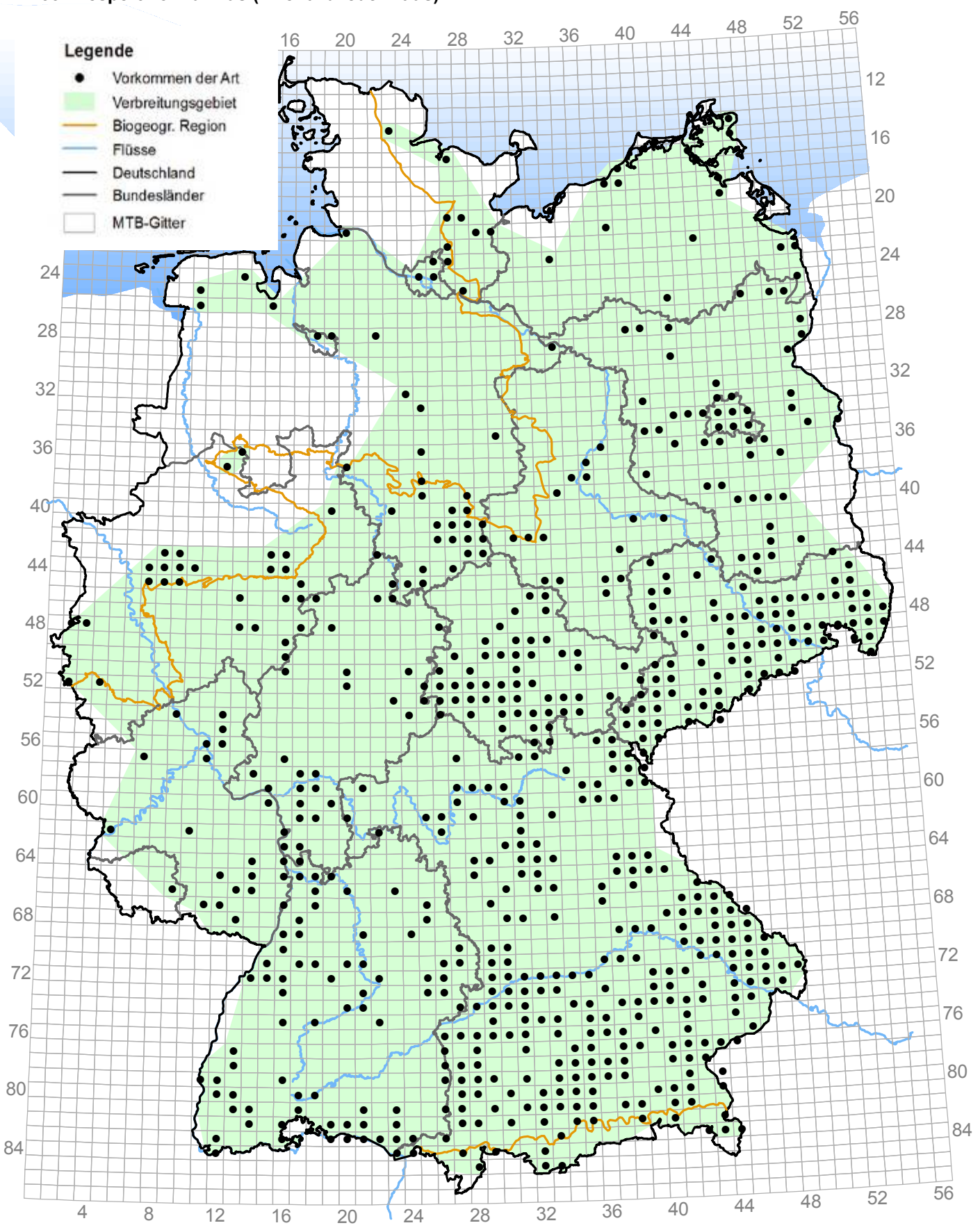
Datengrundlagen: Verbreitungsdaten der Bundesländer und des BfN

Kombinierte Vorkommens- und Verbreitungskarte der Pflanzen- und Tierarten der FFH-Richtlinie

Stand: Dezember 2013

Berichtsjahr: 2013

1332 Vespertilio murinus (Zweifarbfledermaus)



Bundesamt für Naturschutz

Geobasisdaten (c) GeoBasis-DE / BKG

0 50 100 Kilometer

Quelle: Nationaler FFH-Bericht 2013

Datengrundlagen: Verbreitungsdaten der Bundesländer und des BfN