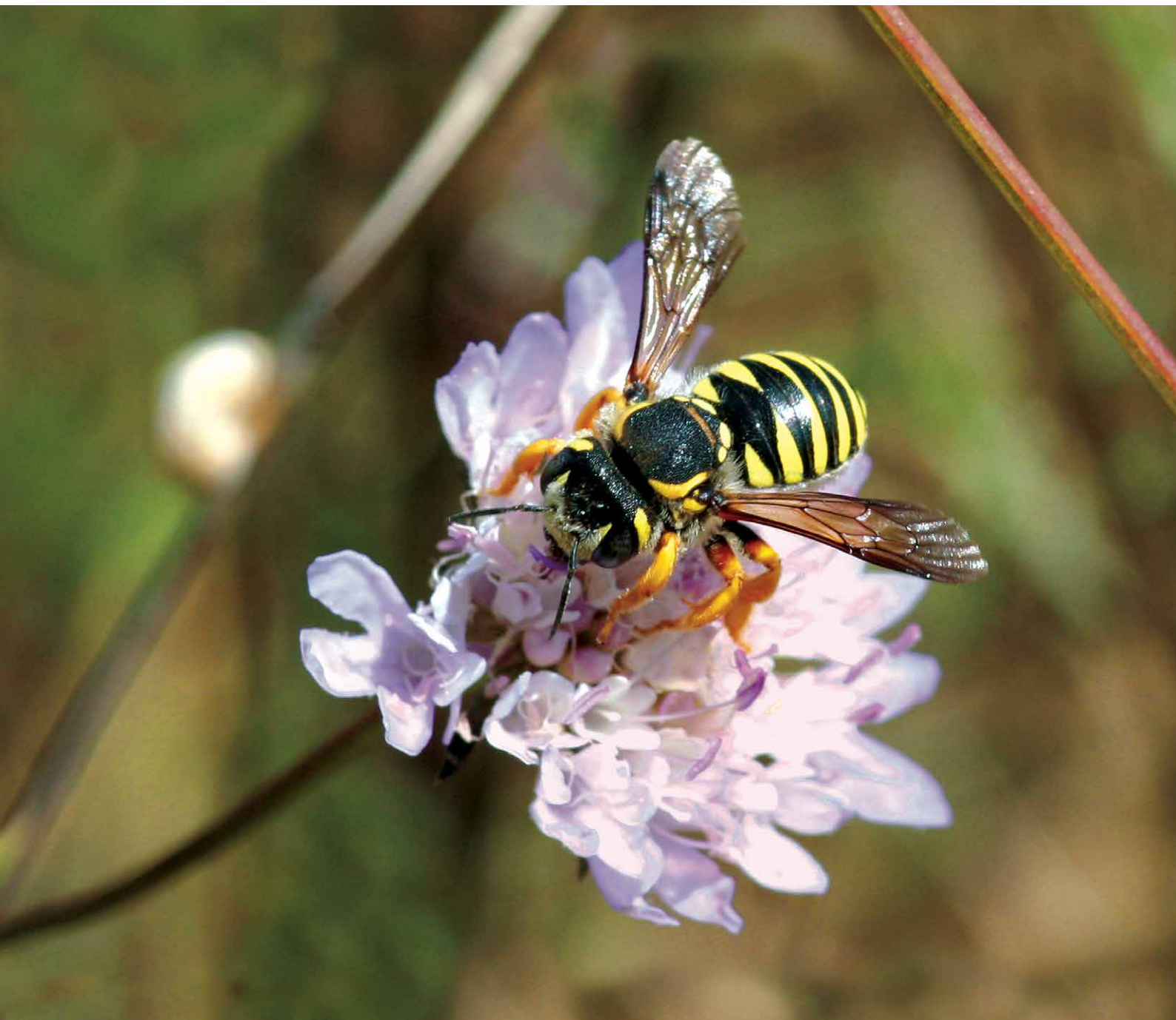


European Red List of Bees

Ana Nieto, Stuart P.M. Roberts, James Kemp, Pierre Rasmont, Michael Kuhlmann, Mariana García Criado, Jacobus C. Biesmeijer, Petr Bogusch, Holger H. Dathe, Pilar De la Rúa, Thibaut De Meulemeester, Manuel Dehon, Alexandre Dewulf, Francisco Javier Ortiz-Sánchez, Patrick Lhomme, Alain Pauly, Simon G. Potts, Christophe Praz, Marino Quaranta, Vladimir G. Radchenko, Erwin Scheuchl, Jan Smit, Jakub Straka, Michael Terzo, Bogdan Tomozii, Jemma Window and Denis Michez



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Table of contents

Foreword	iv
Acknowledgements	v
Executive summary	viii
1. Background	1
1.1 The European context.....	1
1.2 European bees: diversity and endemism.....	2
1.3 Bee ecology.....	3
1.4 Importance of bees in pollination.....	6
1.5 Assessment of species extinction risk.....	6
1.6 Objectives of the assessment.....	7
2. Assessment methodology	8
2.1 Geographic scope.....	8
2.2 Taxonomic scope.....	8
2.3 Assessment protocol.....	8
2.4. Species mapping.....	8
3. Results	10
3.1 Threat status.....	10
3.2 Status by taxonomic group.....	13
3.3 Spatial distribution of species.....	18
3.4 Major threats to bees in Europe.....	21
3.5 Population trends.....	23
3.6 Gaps in knowledge.....	25
4. Conservation measures	26
4.1 Biodiversity protection in Europe and the EU.....	26
4.2 Conservation of bee species in the EU.....	26
4.3 Conservation of bee species at the national level.....	27
4.4 Extinction risk versus conservation status.....	28
4.5 Red List versus priority for conservation action.....	29
5. Recommendations	30
5.1 Policy recommendations.....	30
5.2 Application of project outputs.....	31
5.3 Future work.....	31
References	33
Appendix 1. Red List status of European bees	42
Appendix 2. Example of species summary and distribution map	78

Foreword



Europe's landscape has been shaped by centuries of diverse farming and forestry traditions. This has resulted in a wide range of agricultural and woodland landscapes and significantly contributed to the continent's biodiversity. In addition, the EU's Outermost Regions and Europe's Overseas Countries and Territories are situated in five biodiversity hotspots, including areas that host over 20% of the world's coral reefs and lagoons, and 70% of the EU's biodiversity.

Biodiversity loss is an enormous challenge in the EU, with Europe's species richness currently highly threatened by human activities. Progress has been made on a number of fronts: certain populations and distributions of wildlife species are showing positive trends, with some species that were once at risk of extinction now stabilising or even increasing. The Birds and Habitats Directives, the cornerstone of the EU's nature policies, have clearly helped bird species and some large carnivore species to recover in Europe, which is encouraging.

However, many of Europe's ecosystems are now so heavily degraded that their ability to deliver valuable ecosystem services has been drastically reduced. The EU Biodiversity Strategy adopted in 2011 is part of a 2050 vision aiming to protect, value and restore biodiversity and the services it provides – its natural capital. This is important not only to protect nature's intrinsic value, but also for its essential contribution to human wellbeing and economic prosperity, and to avert catastrophic changes caused by the loss of biodiversity.

In recent years, the decline of pollinators has garnered increased public attention. Indeed, insect pollination, which is currently under threat in Europe, has an estimated economic value of €15 billion per year in the EU alone. Unfortunately, however, the value of natural capital to our economies and societies, and the interdependencies of nature with other societal objectives, are often not reflected in private and public decisions, indicators and accounting systems in the same way as economic and human capital.

The European Red List of Bees provides, for the first time, factual information on the status of all bees in Europe, nearly 2,000 species. This new assessment shows us that 9% of bees are threatened with extinction in Europe mainly due to habitat loss as a result of agriculture intensification (e.g., changes in agricultural practices including the use of pesticides and fertilisers), urban development, increased frequency of fires and climate change.

To conclude, I must recognize that when undertaking this assessment, I was struck by the very limited number of experts on wild bees in Europe and would strongly call for more investment in this important field of scientific research and also for more engagement of all parts of our society to help strengthen the knowledge needed to reverse these negative trends. We need to ensure far-reaching actions to help boost pollinator populations, which will bring huge benefits not only to wildlife and the countryside, but also to our food producers.

Pia Bucella

Director

Directorate B: Natural Capital
European Commission

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Expert participants at a Bee Red List training workshop, October 2012, Brussels, Belgium. © IUCN.



Executive summary

Aim

The European Red List is a review of the status of European species according to IUCN regional Red Listing guidelines. It identifies those species that are threatened with extinction at the regional level, so that appropriate conservation action can be taken to improve their status. This Red List publication summarises results for all described native European bees.

Scope

All bee species native to Europe or naturalised in Europe before AD 1500 (a total of 1,965 species) have been included in this Red List. The geographical scope is continent-wide, extending from Iceland in the west to the Urals in the east, and from Franz Josef Land in the north to the Canary Islands in the south. The Caucasus region is not included. Red List assessments were made at two regional levels: for geographical Europe, and for the 27 Member States of the European Union.

Status assessment

The status of all species was assessed using the IUCN Red List Criteria (IUCN 2012a), which are the world's most widely accepted system for measuring extinction risk. All assessments followed the Guidelines for Application of IUCN Red List Criteria at Regional Levels (IUCN 2012b).

These assessments were compiled based on the data and knowledge from a network of leading European and national bee experts. The assessments were then completed and reviewed at seven small workshops held in Brussels (Belgium) as well as through email correspondence with relevant experts. More than 40 experts actively participated in the assessment and review process for European bees. Assessments are available on the European Red List website and data portal: <http://ec.europa.eu/environment/nature/conservation/species/redlist> and <http://www.iucnredlist.org/initiatives/europe>.

Results

Overall, 9.2% of bees are considered threatened in all of Europe, while at the EU 27 level, 9.1% are threatened with extinction. A further 5.2% and 5.4% of bees are considered Near Threatened in Europe and the EU 27, respectively (101 species at both levels). However, for 1,101 species (56.7%) in Europe and 1,048 species (55.6%) at the EU 27, there was not enough scientific information to evaluate their risk of extinction and thus, they were classified as Data Deficient. When more data become available, many of these might prove to be threatened as well.

By comparison, of groups that were comprehensively assessed in Europe, 59% of freshwater molluscs, 40% of freshwater fishes, 23% of amphibians, 20% of reptiles, 17% of mammals, 16% of dragonflies, 13% of birds, 9% of butterflies and 8% of aquatic plants are threatened (IUCN 2011a, BirdLife International 2004). Additional European Red Lists assessing only a selection of species showed that 22% of terrestrial molluscs, 16% of crop wild relatives, 15% of saproxylic beetles and 2% of medicinal plants are also threatened (IUCN 2011a, Allen *et al.* 2014). No other groups have yet been assessed at the European level.

Looking at the population trends of European bee species, 7.7% (150 species) of the species have declining populations, 12.6% (244 species) are more or less stable and 0.7% (13 species) are increasing. The population trends for 1,535 species (79%) remains unknown.

A high proportion of threatened bee species are endemic to either Europe (20.4%, 400 species) or the EU 27 (14.6%, 277 species), highlighting the responsibility that European countries have to protect the global populations of these species. Almost 30% of all the species threatened (Critically Endangered, Endangered, or Vulnerable) at the European level are endemic to Europe (e.g., found nowhere else in the world).

The species richness of bees increases from north to south in Europe, with the highest species richness being found in the Mediterranean climate zone. In particular, the Iberian, Italian and Balkan peninsulas are important

areas of species richness. Regarding the distribution of endemic species, southern Europe shows the highest concentration of endemism. The largest numbers of threatened species are located in south-central Europe and the pattern of distribution of Data Deficient species is primarily concentrated in the Mediterranean region.

The main threat to European bees is habitat loss as a result of agriculture intensification (e.g., changes in agricultural practices including the use of pesticides and fertilisers), urban development, increased frequency of fires and climate change.

Recommendations

Policy recommendations

1. Species conservation

- Identify opportunities under European and Member State Biodiversity Strategies to develop targeted species and habitat specific conservation measures for wild bees, and particularly those species of conservation concern.
- Develop systematic continental and national tools and resources to monitor the diversity and abundance of bees, including rare species as well as wider bee biodiversity. Ensure standardised methods are adopted to allow comparison across and within European countries.
- Build dedicated networks of bee experts to advise local and national authorities on effective conservation actions.
- Develop measures and legislation to reduce the potential for pest and disease transmission between managed and wild bees, particularly in areas where priority bee species are present. International trade in managed pollinators should be regulated, and the local breeding of managed pollinators for pollination services encouraged.

2. Habitat conservation

- Increase the protection of habitats supporting high bee diversity and endemism, and also those that act as source habitats for bees, with particular focus on Mediterranean and montane areas and species-rich grasslands.
- Develop new targets and indicators for priority bee habitats to assess and monitor their contribution to overall landscape quality for bees.

- Enhance cross-policy coordination to strengthen protection and restoration work for existing ecological networks (e.g., Natura 2000), including protected area sites, agri-environment measures and green infrastructure.
- Provide clear guidance to local and national planning authorities on how to implement Green Infrastructure in order to enhance the quality of the built landscape for wild bees, for example, by creating areas of wildflowers on green spaces around new developments.

3. Agri-environment schemes

- Improve the effectiveness of Agri-Environment Schemes (AES) by setting specific long-term objectives, including those for wild bees, at a range of spatial scales, and develop targeted options to support wider bee biodiversity in agro-ecosystems.
- Develop new AES measures which provide forage and, in particular, nesting resources for bees in a range of farming systems.
- Provide “bundles” of bee-friendly measures within AES, which can be deployed together to provide forage, nesting and other resources within local landscapes.
- Encourage industry-led efforts to support the uptake and effective management of AES options that benefit bees.

4. Agricultural production

- Realise opportunities under the Common Agricultural Policy (CAP) Pillar I to promote sustainable agriculture and improve the baseline quality of farmed land for bees by expanding the area required for Ecological Focus Areas (EFA) and encouraging novel land uses such as planting legumes and other cover crops.
- Encourage and support arable farmers to provide more diverse and abundant mass-flowering crops for bees within the farmed landscape.
- Develop additional support for alternative sustainable farming systems such as agroforestry and infield mixed cropping which can have substantial benefits to bees.
- Commit to a sustainable long-term reduction in the use of pesticides, with quantitative targets for the reductions in the total application of all pesticide active ingredients, and encourage the uptake of alternative pest management methods including the use of natural enemies and Integrated Pest Management (IPM).

- Improve the advice to farmers, landowners, managers of public and amenity spaces and gardeners on best practices for using insecticides. This should draw upon research evidence to provide guidance which takes into account the diverse life histories of European bees and other pollinators.

Supporting activities

5. Knowledge and networks

- Support further research into the drivers of bee declines at a range of local and national scales and the identification of bees that act as indicators of localised ecosystem health.
- Invest in systematic research to fully characterise bee diversity across Europe.
- Expand the pool of bee experts and tools for bee identification, by facilitating European academic and government organisations to work together to strengthen the pool of taxonomic expertise and individuals able to identify species.
- Digitise national bee collections to make existing data widely available for analysis and to fill knowledge gaps.
- Establish a Europe-wide database of bee species with point data, linking the work of various NGOs and regional initiatives.

Dioxys cincta (Least Concern). © D. Genoud.



1. Background

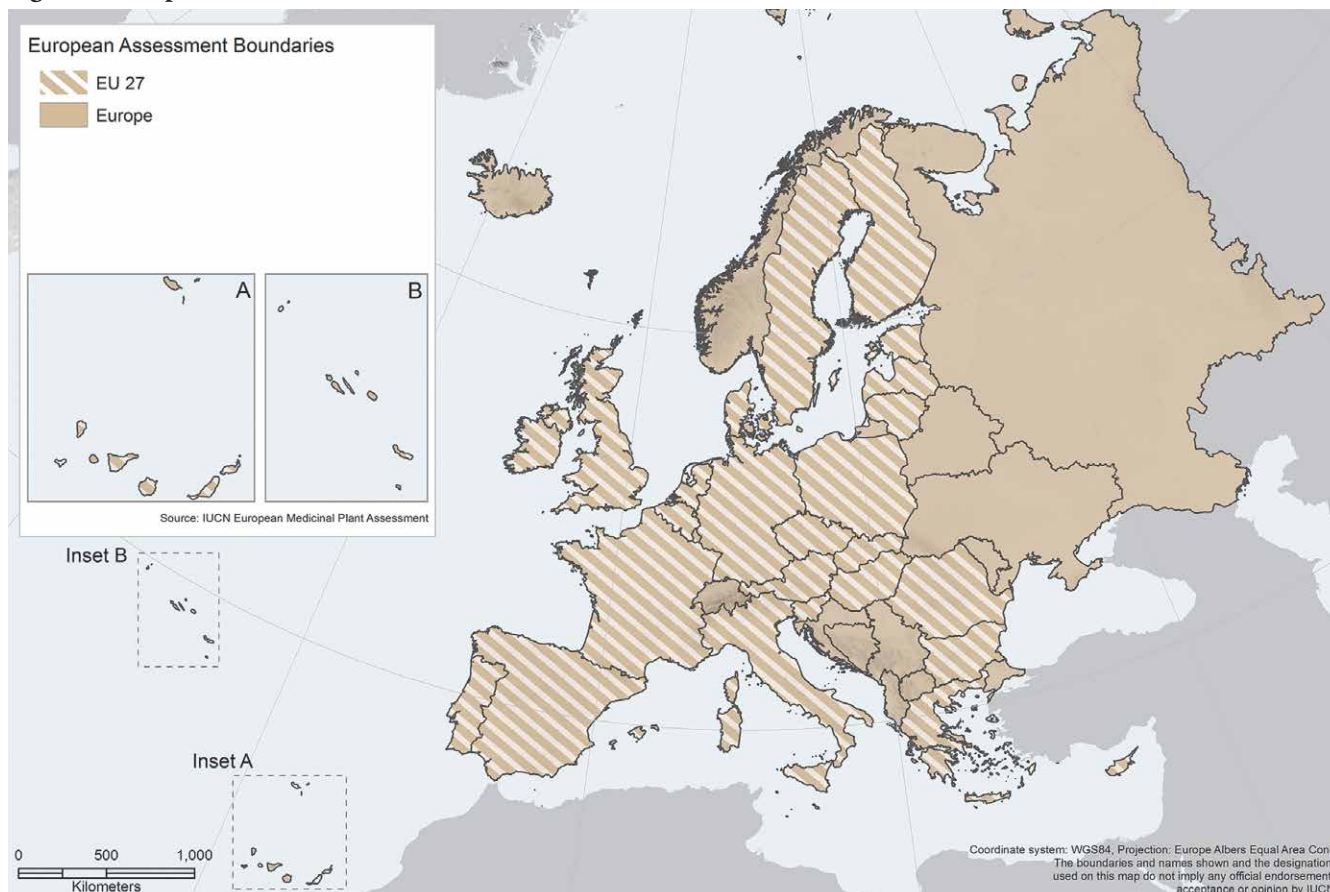
1.1 The European context

Europe is recognised as a continent in the seven continent model of the world, although physically and geologically it is the westernmost peninsula of Eurasia. Europe is bounded to the north by the Arctic Ocean, to the west by the Atlantic Ocean, to the south by the Mediterranean Sea, and to the south-east by the Black Sea and the Caucasus Mountains. In the east, Europe is separated from Asia by the Ural Mountains and by the Caspian Sea (see Figure 1). Europe is the world's second-smallest continent in terms of area, covering approximately 10,400,000 km² or 2% of the Earth's surface. In terms of human population, Europe is the third-largest continent (after Asia and Africa) with a population of some 740 million (UN DESA 2012) – about 11% of the world's population. Europe has the most highly urbanised population and, together with Asia, is the most densely populated continent in the world.

The European Union is Europe's largest political and economic entity. It is the world's largest economic block with an estimated gross domestic product (GDP) in 2013 of 13 trillion Euros for the EU 27 Member States (Eurostat 2014). Per-capita GDP in many EU states is among the highest in the world, and rates of resource consumption and waste production are correspondingly high – the EU 27's "ecological footprint" has been estimated to exceed the region's biological capacity (the total area of cropland, pasture, forest, and fishing grounds available to produce food, fibre and timber, and absorb waste) by 2.6 times (WWF 2007).

Europe includes areas of great diversity of landscapes and habitats and a wealth of flora and fauna. European biodiversity includes more than 520 species of birds (Birdlife 2014), 138 species of dragonflies and damselflies (Kalkman *et al.* 2010), 260 species of mammals (Temple and Terry 2007, 2009), 151 species of reptiles (Cox and

Figure 1. European assessment boundaries*.



* Regional assessments were made for two areas: geographical Europe and the EU 27.

Temple 2009), 85 species of amphibians (Temple and Cox 2009), 546 species of freshwater fishes (Kottelat and Freyhof 2007, Freyhof and Brooks 2011), around 1,200 species of marine fishes (IUCN in prep. 2015), 20-25,000 species of vascular plants (Euro+Med 2006-2011) and well over 100,000 species of invertebrates (Fauna Europaea 2004). The Mediterranean part of Europe, which is especially rich in plant and animal species, has been recognised as a global biodiversity hotspot (Mittermeier *et al.* 2004, Cuttelod *et al.* 2008).

Europe has arguably the most highly fragmented landscapes of all continents, and only a tiny fraction of its land surface can be considered as wilderness. For centuries most of Europe's land has been used by humans to produce food, timber and fuel, and also to provide living space. Currently, in western Europe, more than 80% of land is under some form of direct management (EEA 2007). Consequently European species are to a large extent dependent upon habitats created and maintained by human activity, particularly traditional, non-intensive forms of land management. These habitats are under pressure from agricultural intensification, commercial forestry, urban sprawl, infrastructure development, land abandonment, acidification, eutrophication, and desertification. Many species are directly affected by overexploitation, persecution, and impacts of alien invasive species, and climate change is set to become an increasingly serious threat in the future. Europe is a huge, diverse region and the relative importance of different threats varies widely across its biogeographic regions and countries.

Although considerable efforts have been made to protect and conserve European habitats and species (e.g., see Sections 4.1, 4.2, 4.3) and the Natura 2000 network of protected areas covers almost 18% of the EU territory (IEEP 2011), biodiversity decline and the associated loss of vital ecosystem services (such as water purification, pollination, flood protection, and carbon sequestration) continues to be a major concern in the region.

1.2 European bees: diversity and endemism

Bees constitute a 120 million year old monophyletic group that today includes approximately 20,000 described species worldwide (Michez *et al.* 2012, Danforth *et al.* 2013, Ascher and Pickering 2014). They rely almost exclusively on flowers for protein, lipids, and sugar

throughout their life cycle (Michener 2007). Ollerton *et al.* (2011) estimated that 87.5% of all flowering plants (i.e. Angiosperms) are adapted to animal pollination, a large majority of which occurs through bees as they are the main pollinators in most ecosystems. The evolution of bees and flowering plants are therefore intrinsically linked. Bees have been recorded worldwide, in all continents and all habitats, wherever flowering plants are present.

A recent checklist collated by Kuhlmann *et al.* (2014) showed that western Palearctic bee fauna totals about 3,370 species. Based on this checklist, and considering the European Red List boundaries, 1,965 species were assessed at the European level, and 1,900 species were assessed at the EU 27 level for the purposes of the European Red List of bees. These species are divided into six families and two groups:

- (i) Apidae and Megachilidae form the group of long-tongued bees;
- (ii) Andrenidae, Colletidae, Halictidae and Melittidae represent the short-tongued bees (see Table 1).

As there are approximately 20,000 species worldwide, Europe hosts about 10% of worldwide bee diversity, although the continent only represents 7% of global terrestrial habitats. The most prominent and diverse family of bees is the Apidae (561 species), which includes the Honey bee and the bumblebees (*Bombus spp.*), while the least diverse family is the Melittidae with only 37 species.

The relatively high species diversity in Europe is partially explained by the presence of areas with a Mediterranean climate as this climate provides the optimal conditions for bee diversity (Michener 1979). Moreover, taxonomic research on bees in Europe has a very rich and well documented history and may skew the known diversity of bees, as many species have yet to be described in several other areas of the world. European authors, such as Linnaeus (1707-1778), Kirby (1759-1850), Latreille (1762-1833) and Lepeletier (1770-1845) were some of the first taxonomists to describe bees. Their type material, or original specimens, are still well conserved and available for study in European academic institutions.

The mapping of bee diversity in Europe (Figure 7) highlights a general north-south positive gradient, with diversity increasing towards the Mediterranean area. Two

features explain this pattern across Europe: (i) the more favourable energy/water balance of the Mediterranean areas which has resulted in extremely high floral diversity (Patiny *et al.* 2009); and (ii) the likely role of these areas as refuges during the Quaternary glaciations (Reinig 1937, De Lattin 1967).

There are 400 species (20.4%) that are endemic to Europe and 277 species (14.6%) that are endemic to the EU 27 (see Table 1). At the European level, the family with the highest percentage of endemism is the Melittidae with 35.1%, and the family with the lowest endemism are the Megachilidae with only 16.7% (Table 1). At the EU 27 level, the family with the highest percentage of endemism is the Colletidae with 21% and the family with the lowest endemism are the Apidae and the Megachilidae with 13.5% (Table 1).

Many of the European endemic species are predominantly found on restricted montane habitats (Alps: *Osmia steinmanni* Müller 2002; Sierra Nevada: *Bombus reinigiellus* Rasmont 1983), islands such as the Canary Islands (e.g., *Melecta canariensis* Hohmann *et al.* 1993), and the Mediterranean islands of the Balearics (*Anthophora balearica* Friese 1896), Corsica (e.g., *Bombus pereziellus* Rasmont and Adamski 1996), Crete (e.g., *Ceratina teunissenii* Terzo and Rasmont 1997), Cyprus (e.g., *Chelostoma comosum* Müller 2012), and Sicily (e.g., *Chelostoma siciliae* Müller 2012). The Mediterranean peninsulas of Spain, Italy and Greece also show a higher percentage of endemic species.

1.3 Bee ecology

Bee ecology can be characterised based on food, sociality and nesting requirements.

Bees can collect various resources from plants such as pollen, nectar, and less commonly, oil or perfumes; some materials used for nesting like resin, soil, and pieces of leaves and petals are also collected (Wcislo and Cane 1996, Michener 2007). Various foraging strategies have been described for bees mainly based upon the range of pollen collection from host plant(s). Bees collect pollen as a food source for their larvae and, in doing so, help pollinate the flowers of the plants upon which they forage. Some taxa display floral specificity, restricting their flower visits to closely related plant taxa (pollen specialists) while other bee species are more opportunistic, exploiting a wide range of different flowers (pollen generalists) (Dötterl and Vereecken 2010). Terms have been developed to describe the continuum in bee foraging strategies, from extreme specialisation to extreme generalisation: (i) monolecty (one host plant species); (ii) oligolecty (one host plant family) and (iii) polylecty (more than one host-plant family) (Cane and Sipes 2006, Müller and Kuhlmann 2008). Moreover, quantitative pollen requirement is relatively high for bees as they forage only on pollen for protein resources while other pollinators like syrphid flies or butterflies feed on alternative resources in the larval stage. Depending on both bee species and plant resources, from seven to 1,100 flowers or from 0.9 to 4.5 inflorescences are needed to rear a single larva (Müller *et al.* 2006).

Table 1. Diversity and endemism in bee families in Europe*.

Class	Order	Family	Europe		EU 27	
			Number of species	Number of endemic species (% endemic)	Number of species	Number of endemic species (% endemic)
Insecta	Hymenoptera	Andrenidae	465	96 (20.6%)	443	62 (14%)
		Apidae	561	107 (19.1%)	535	72 (13.5%)
		Colletidae	146	40 (27.4%)	143	30 (21%)
		Halictidae	314	70 (22.3%)	306	47 (15.4%)
		Megachilidae	442	74 (16.7%)	436	59 (13.5%)
		Melittidae	37	13 (35.1%)	37	7 (18.9%)
Total		1,965	400 (20.4%)	1,900	277 (14.6%)	

* This table includes species that were native or naturalised since before AD 1500; species introduced after this date are not included. Species of marginal occurrence in Europe or the EU 27 are included. For the EU 27 level assessment the Not Evaluated species (species which do not occur in the EU and that represent a total of 65 species) are excluded.

Species representing one of the genera from the six families of European bees.

Family Apidae, *Nomada ruficornis* (Least Concern). © S. Falk



Family Colletidae, *Colletes hylaeiformis* (Least Concern). © B. Jacobi



Family Halictidae, *Sphexodes niger* (Least Concern) © E. Phillips



Family Megachilidae, *Anthidium oblongatum* (Least Concern). © D. Genoud



Family Andrenidae, *Andrena coitana* (Data Deficient). © R. Williams



Family Melittidae, *Dasygaster visnaga* (Least Concern). © J. Devalez



Pollen is not the only food source for bees. Vascular plants produce substances such as nectar and oils. The extraction and gathering of such substances can require morphological adaptations. The morphological feature used for nectar collection is the labiomaxillary complex (i.e. the proboscis or tongue) that may be differentially shortened or elongated to reach nectar (Wcislo and Cane 1996). Another non-pollen resource for bees is the plant itself, especially its tissues. Bees use resins, masticated leaves, cut petals, trichomes or other plant materials, sometimes along with mud and saliva, to construct nests in cavities or in the soil (Müller 2011). Females can also use circular excisions of leaves and petals to line their brood cells (e.g., some *Megachile* s.l. species, some Osmiini species) or masticated leaves to hide the nest (e.g., some *Osmia* species, Rozen *et al.* 2010).

Sociality is very variable among bees. Species can be solitary, social or kleptoparasitic, although the majority of the species are solitary. In strictly solitary species, each female builds a nest by herself, prepares the nest for her larvae and then dies without ever having contact with either her offspring or with her conspecifics, except of course for mating. The social species include the most familiar species such as the Honey Bee and the bumblebees, yet at world scale they represent only 6% of the bee species diversity (Danforth 2007) and are restricted to two families (Apidae and Halictidae). The social species are made up of colonial family groups, with reproductive division of labour, cooperative brood care and overlapping generations (Michener 1974). These colonies typically show a bias in the degree of reproduction where only a small number of individuals lay the majority of eggs; the other individuals are sterile, or lay unfertilised male eggs and mainly care for the offspring (Brady *et al.* 2006, Holmes *et al.* 2014). The last category includes bees that do not collect pollen but are parasites of other bee species. Parasitic, cuckoo or kleptoparasitic bees make up approximately 20% of described species globally (Danforth *et al.* 2013). In Europe, three out of the six families of wild bees include at least one genus of species with exclusively parasitic ways of life (Apidae, Halictidae and Megachilidae). Cuckoo bees can be very variable in their host spectrum; some are exclusively linked to one host-bee species, while others have two to numerous hosts and are then considered generalists. Host generalist cuckoo bees are host specialised at the individual level (Bogusch *et al.* 2006), while host specialists can switch among the hosts without considerable change to their specialised strategy during their evolution (Habermannová *et al.* 2013).

Concerning the nesting behaviour of bees, a distinction can first be made between the ground-nesting digger species and the ones that nest away from the ground or in existing underground cavities. The ground-nesting digger species account for over half of all the species in the world (Michener 2007). In these taxa, the ground texture, sun exposure and degree of slope can be important factors in determining nest sites (Potts *et al.* 2005). Some species such as *Dasypoda hirtipes* (Melittidae), *Andrena fuscipes* (Andrenidae) and *Panurgus calcaratus* (Andrenidae), have a preference for well-exposed sandy sites. Other species, such as *Colletes cunicularius* (Colletidae) and *Andrena vaga* (Andrenidae), are strictly dependent on sandy ground (psammophilous species) (Vereecken *et al.* 2006). Among the non-digging species, some excavate their galleries in plants (e.g., stems), while others do so in rock crevices, soil or abandoned nests. Other species build potter nests in mud, or in plant resin or fibres. For example, *Megachile parietina* builds cells with dried mud on rock sides or walls. In *Icteranthidium* and *Anthidiellum*, the females harvest resin from conifers to build brood cells and attach them to a support they made of mineral or plant materials. Finally, many long-tongued bees (Apidae and Megachilidae) nest in a variety of existing holes, either naturally made or created by another organism. Some species even nest exclusively in empty snail (Helicidae) shells (e.g., *Osmia bicolor* and *Osmia aurulentata*). A number of species of the genus *Bombus* nest in much larger cavities. *Bombus terrestris*, for example, can set up home underground in abandoned rodent galleries. *B. hypnorum* often nest in old bird nests installed in tree hollows. The carder bees, *Bombus pascuorum* and *Bombus muscorum*, for example, nest in accumulations of dried grassland plant litter on the ground surface.

Megachile parietina (Least Concern). © Andrej Gogala.



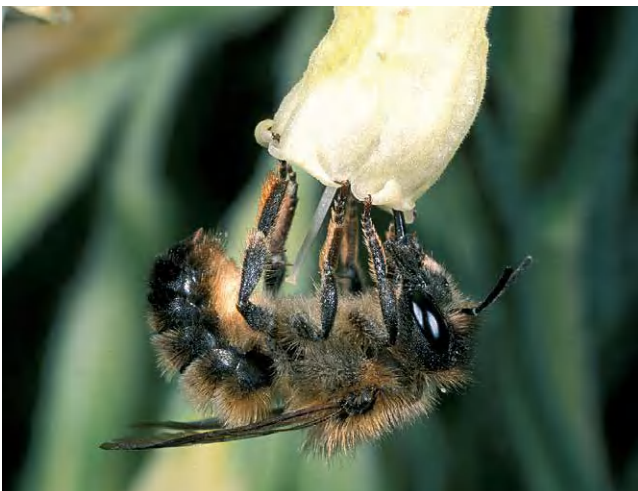
1.4 Importance of bees in pollination

By collecting floral resources (i.e., pollen, nectar) for feeding, bees carry pollen on their bodies and transfer it from flower to flower. They can fertilise plants this way through pollination, allowing the plants to reproduce sexually. The ubiquity of bees and their tight association with flowering plants makes their role in pollination a global keystone in wild and agricultural ecosystem dynamics.

In terms of global agricultural production volumes, 35% comes from crops that depend (to a greater or lesser extent) on pollinators, mainly insects (i.e. one third of human food is mainly from plants pollinated by insects). Out of the 124 main crops grown for global human consumption, 87 (70%) require insect pollination for seed production (e.g., carrots, onions, garlic) and to enhance product quality and yields (e.g., coffee, nuts, many fruits) (Klein *et al.* 2007). Bees provide an ecosystem service in the form of crop pollination estimated to be 153 billion Euros a year worldwide (Gallai *et al.* 2008) and 22 billion Euros a year in Europe (Gallai *et al.* 2008).

Enhanced bee pollination can lead to benefits such as increased production, better crop quality and shelf life, yield stability and higher commercial value for many entomophilous crops (e.g., strawberries, (Klatt *et al.* 2014) and apples, (Garrat *et al.* 2014, Garibaldi *et al.* 2011)). Bee species diversity is also important as recent studies show that wild bees are responsible for a greater proportion of the pollination service previously attributed to domesticated honey bees (*Apis mellifera*) (Garibaldi *et al.* 2013). In addition, some crop plants can only be pollinated by a restricted number of species (Klein *et al.* 2007) hence the loss of bee biodiversity can lead to loss of plant diversity.

Osmia apicata (Least Concern). © Andrej Gogala.



1.5 Assessment of species extinction risk

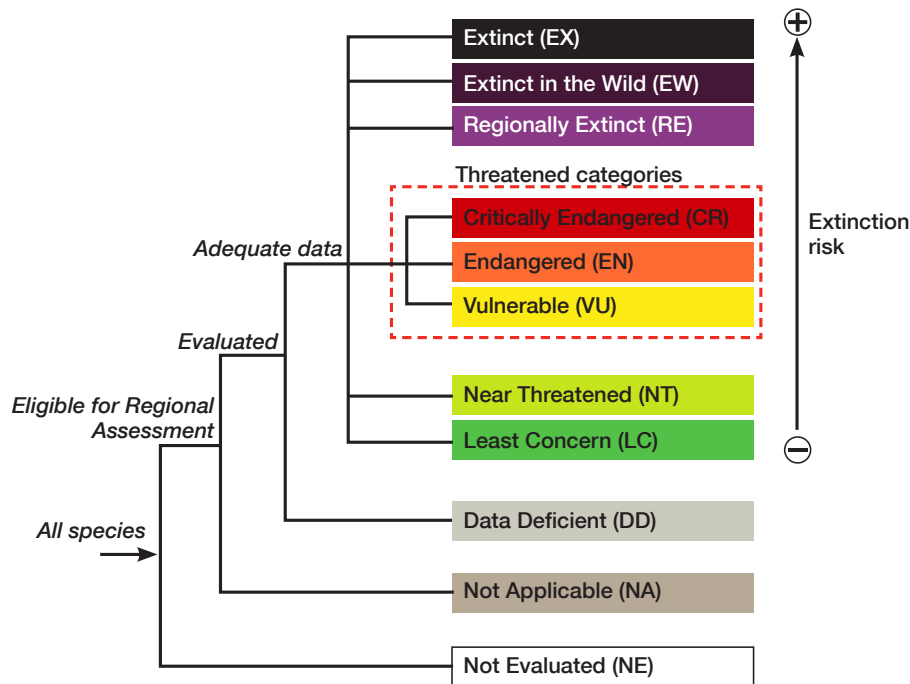
The conservation status of plants and animals is one of the most widely used indicators for assessing the condition of ecosystems and their biodiversity. It is intended to be policy-relevant, and it can be used to inform conservation planning and priority setting processes, but it is not intended to be policy-prescriptive, and it is not in itself a system for setting biodiversity conservation priorities.

At the global scale, the primary source of information on the conservation status of plants and animals is the IUCN Red List of Threatened Species™ (www.iucnredlist.org). The IUCN Red List Categories and Criteria are designed to determine a taxon's relative risk of extinction, with the main purpose of cataloguing and highlighting those taxa that are facing a higher risk of extinction. The Red List provides taxonomic, distribution, ecological, threat and conservation status information on taxa that have been evaluated using the IUCN Red List Categories and Criteria (IUCN 2012a).

The IUCN Red List Categories (Figure 2) are based on a set of quantitative criteria linked to population trends, population size and structure, and geographic range. There are nine Categories, and species classified as Vulnerable (VU), Endangered (EN) and Critically Endangered (CR) are considered as 'threatened'. When conducting regional or national assessments, the IUCN Red List Regional Guidelines (IUCN 2012b) are applied, and two additional categories are used: Regionally Extinct, and Not Applicable (see Figure 2).

As the extinction risk of a species can be assessed at global, regional or national levels, one species can have a different Red List Category in the Global Red List and in a Regional Red List. For example, a species that is common worldwide and classed as Least Concern (LC) in the Global Red List could face a high level of threat and fit the Endangered Category (EN) in a particular region. Logically, an endemic species should have the same category at regional and global levels, as it is not present in any other part of the world.

Figure 2. The IUCN Red List Categories at the regional scale.



1.6 Objectives of the assessment

The European regional assessment has four main objectives:

- To contribute to regional conservation planning through provision of a baseline dataset reporting the status of European bee species.
- To identify those priority geographic areas and habitats needing to be conserved to prevent extinctions and to ensure that European bees reach and maintain a favourable conservation status.
- To identify the major threats and to propose potential mitigating measures and conservation actions to address them.
- To strengthen the network of experts focused on bee conservation in Europe, so that the assessment information can be kept current, and expertise can be targeted to address the highest conservation priorities.

The assessment provides three main outputs:

- This summary reports on the status of all 1,965 European bee species.
- A freely available database holding the baseline data for monitoring the status and distribution of European bees.

A website and data portal (<http://ec.europa.eu/environment/nature/conservation/species/redlist> and <http://www.iucnredlist.org/initiatives/europe>) showcasing this data in the form of species factsheets for all European bees included in this study, along with background and other interpretative material.

The data presented in this report provides a snapshot based on the knowledge available at the time of writing. The database will continue to be updated and made freely and widely available. IUCN will ensure wide dissemination of this data to relevant decision makers, NGOs, scientists and practitioners to inform the implementation of conservation actions on the ground.

2. Assessment methodology

2.1 Geographic scope

The geographical scope is continent-wide, extending from Iceland in the west to the Urals in the east (including European parts of the Russian Federation), and from Franz Josef Land in the north to the Mediterranean in the south (see Figure 1). The Canary Islands, Madeira and the Azores were also included. In the southeast, where definitions of Europe are most variable, the Caucasus region was not included.

Red List assessments were made at two regional levels: 1) for geographical Europe (limits described above); and 2) for the area of the 27 Member States of the European Union.

2.2 Taxonomic scope

The European Red List of bees has assessed the status of all native bee species to Europe or naturalised before AD 1500, a total of 1,965 bee species. Species introduced to Europe by man after AD 1500 were not considered in the assessment. Species that are of marginal occurrence in Europe were classed as Not Applicable (NA).

The initial species list was based on Kuhlmann *et al.* (2014). The taxonomy of the genus *Andrena* largely follows Gusenleitner and Schwarz (2002).

2.3 Assessment protocol

For all the bee species assessments, the following data were compiled:

- Taxonomic classification
- Geographic range and list of countries of occurrence (including a distribution map)
- Population information and overall population trend
- Habitat preferences and primary ecological requirements
- Major threats
- Conservation measures (in place, and needed)
- Species utilisation
- Other general information
- Red List Category and Criteria
- Key literature references

The task of collecting the initial data was divided up taxonomically, by family, sub-family or genera. Experts

collected information (see acknowledgement section) about each species based on published and unpublished data and their expert opinion. The IUCN Species Information Service (SIS) was used to enter and stored all the species data.

Seven workshops were held throughout the three-year lifespan of the project to review and discuss a selection of species assessments and maps, add new information and agree on the final IUCN Red List Category and Criteria (both at the European and EU 27 levels).

All the species from the family Melittidae, most species of the family Andrenidae (all species from the genera *Camptopoeum*, *Clavipanurgus*, *Flavipanurgus*, *Melitturga*, *Panurginus*, *Panurgus* and *Simpanurgus*, and a selection of *Andrena* species), the species of the genera *Halictus*, *Nomiapis* and *Lasioglossum* (family Halictidae) and the species of the genera *Xylocopa*, *Ceratina* and *Bombus* (family Apidae) were assessed at small workshops organised in Brussels and attended by key experts and IUCN staff. The remaining species were reviewed and discussed by email correspondence with relevant experts.

Following the workshops, the data were edited, and outstanding questions were resolved through communications with the experts. Consistency in the use of IUCN Criteria was checked by IUCN staff. The resulting finalised IUCN Red List assessments are a product of scientific consensus concerning species status and are backed by relevant literature and data sources.

2.4. Species mapping

Bee species maps were created using distribution data available from the published literature, internet sources, and the Atlas Hymenoptera (Rasmont and Haubruge 2014). The data available varied immensely in terms of quality; for some species, distributions were available as either point location data (latitude/longitude) or in grid cell format and were therefore spatially precise. Where point or grid data were available, data were projected in a Geographical Information System (GIS) (ESRI ArcMap) and polygons drawn manually, clustering occurrence data where appropriate and selecting sub-country units or an entire country for species known to be present or



extinct, but with no localised occurrence data. For some species, it was only possible to assign presence at the country level, and therefore the distribution was mapped for the whole country.

The spatial analyses presented in this publication (see section 3.3) were analysed using a geodesic discrete global grid system, defined on an icosahedron and projected to the sphere using the inverse Icosahedral Snyder Equal Area (ISEA) Projection (S39). This corresponds to a hexagonal grid composed of individual units (cells) that retain their shape and area (864 km²) throughout the globe. These are more suitable for a range of ecological applications than the most commonly used rectangular grids (S40).

The extant (resident) and possibly extant (resident) distributions (the occurrence information can be found

in IUCN (2014)) of each species was converted to the hexagonal grid for analysis purposes. Coastal cells were clipped to the coastline. Patterns of species richness (1,965 species) (Figure 7) were mapped by counting the number of species in each cell (or cell section, for species with a coastal distribution). Patterns of endemic species richness (400 species) were mapped by counting the number of species in each cell (or cell section for coastal species) that were flagged as being endemic to geographic Europe as defined in this project (Figure 8). Patterns of threatened species richness (Categories CR, EN, VU at the European regional level - 77 species) (Figure 9) were mapped by counting the number of threatened species in each cell or cell section. Finally, an analysis of the distribution patterns of Data Deficient species (1,101 species) was performed by counting the number of Data Deficient species within each cell (Figure 10).

3. Results

3.1 Threat status

The status of bees was assessed at two regional levels: geographical Europe and the EU 27.

9.2% and 9.1% of the species are considered threatened at the European and EU 27 levels, respectively. However, the proportion of threatened bee species is uncertain given the high number of Data Deficient species, and could lie between 4% (if all DD species are not threatened) and 60.7% (if all DD species are threatened) for Europe, and 4% and 59.7% for the EU 27 (IUCN 2011b, Table 2). Thus, the mid-point figures provide the best estimation of the proportion of threatened species (IUCN 2011b).

Figure 3 and 4 show the percentage of species in each IUCN Red List Category. In Europe, 0.4% of the species are Critically Endangered, 2.4% are Endangered, and 1.2% Vulnerable. A further 5.2% are classified as Near Threatened.

In the EU 27, 0.3% of the species are Critically Endangered, 2.4% are Endangered, and 1.3% are Vulnerable. A further 5.4% are classified as Near Threatened.

For more than half of the species in Europe (56.7%) and in the EU 27 (55.6%) (Figure 3 and 4), there was not enough data to evaluate their risk of extinction and so they were classified as Data Deficient. As more data becomes available, it is possible that many of these species may also prove to be threatened.

By comparison, 59% of freshwater molluscs, 40% of freshwater fishes, 23% of amphibians, 20% of reptiles, 17% of mammals, 16% of dragonflies, 13% of birds, 9% of butterflies and 8% of aquatic plants are threatened, groups that were comprehensively assessed in Europe (IUCN 2011a, BirdLife International 2004). Additional European Red Lists assessing only a selection of species showed that 22% of terrestrial molluscs, 16% of crop

Table 2. Proportion of threatened species in Europe and EU 27.

	Europe % threat	EU 27 % threat
Lower bound (CR+EN+VU) / (assessed – EX)	4%	4%
Mid-point (CR+EN+VU) / (assessed – EX – DD)	9.2%	9.1%
Upper bound (CR+EN+VU+DD) / (assessed – EX)	60.7%	59.7%

Table 3. Summary of numbers of bee species within each category of threat.

IUCN Red List Categories	No. species Europe (no. endemic species)	No. species EU 27 (no. endemic species)
Extinct (EX)	0	0
Extinct in the Wild (EW)	0	0
Regionally Extinct (RE)	0	0
Critically Endangered (CR)	7 (3)	6 (2)
Endangered (EN)	46 (12)	46 (5)
Vulnerable (VU)	24 (7)	24 (6)
Near Threatened (NT)	101 (17)	101 (5)
Least Concern (LC)	663 (68)	659 (32)
Data Deficient (DD)	1,101 (293)	1,048 (227)
Total number of species assessed*	1,942 (400)	1,884 (277)

*This table does not include the Not Applicable species in Europe (23 species) and/or the EU 27 (16 species) (species introduced after AD 1500 or species of marginal occurrence). For the EU 27 assessment the Not Evaluated species (species which do not occur in the EU 27) are also excluded.

wild relatives, 15% of saproxylic beetles and 2% of medicinal plants are also threatened (IUCN 2011a, Allen *et al.* 2014). No other groups have yet been assessed at

the European level. Bee species classified as threatened (Critically Endangered, Endangered, and Vulnerable) at the European and EU 27 levels are listed in Table 4.

Figure 3. IUCN Red List status of bees in Europe.

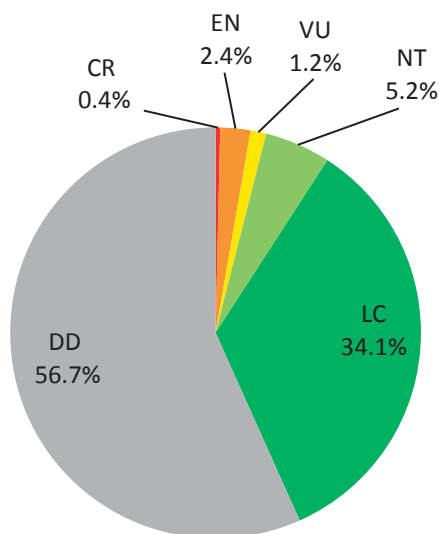


Figure 4. IUCN Red List status of bees in the EU 27.

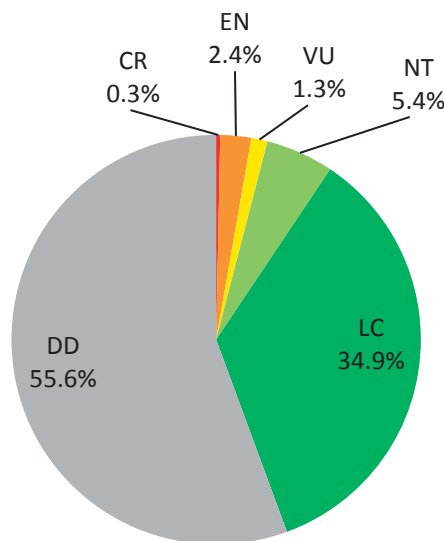


Table 4. Threatened bee species at the European and EU 27 level.

Family	Species	Red List status		Endemic to Europe?	Endemic to EU 27?
		Europe	EU 27		
Apidae	<i>Ammobates dusmeti</i>	CR	CR	Yes	Yes
Andrenidae	<i>Andrena labiata</i>	CR	CR	Yes	No
Andrenidae	<i>Andrena ornata</i>	CR	NE	No	No
Andrenidae	<i>Andrena tridentata</i>	CR	CR	No	No
Apidae	<i>Bombus cullumanus</i>	CR	CR	No	No
Megachilidae	<i>Megachile cypricola</i>	CR	CR	No	No
Apidae	<i>Nomada siciliensis</i>	CR	CR	Yes	Yes
Apidae	<i>Ammobates melectoides</i>	EN	EN	Yes	No
Apidae	<i>Ammobatooides abdominalis</i>	EN	EN	No	No
Andrenidae	<i>Andrena comta</i>	EN	EN	No	No
Colletidae	<i>Colletes wolffi</i>	EN	EN	Yes	Yes
Melittidae	<i>Dasygaster braccata</i>	EN	EN	No	No
Andrenidae	<i>Andrena magna</i>	EN	EN	No	No
Andrenidae	<i>Andrena stepposa</i>	EN	EN	Yes	No
Andrenidae	<i>Andrena stigmatica</i>	EN	NE	No	No
Apidae	<i>Bombus armeniacus</i>	EN	EN	No	No
Apidae	<i>Bombus brodmannicus</i>	EN	EN	No	No
Apidae	<i>Bombus fragrans</i>	EN	EN	No	No
Apidae	<i>Bombus inexpectatus</i>	EN	EN	Yes	No
Apidae	<i>Bombus mocsaryi</i>	EN	EN	No	No
Apidae	<i>Bombus reinigiellus</i>	EN	EN	Yes	Yes
Apidae	<i>Bombus zonatus</i>	EN	EN	No	No
Colletidae	<i>Colletes anchusae</i>	EN	EN	No	No
Colletidae	<i>Colletes caspicus</i>	EN	EN	No	No
Colletidae	<i>Colletes collaris</i>	EN	EN	No	No
Colletidae	<i>Colletes graeffei</i>	EN	EN	No	No
Colletidae	<i>Colletes merceti</i>	EN	EN	Yes	Yes
Colletidae	<i>Colletes meyeri</i>	EN	EN	No	No

Family	Species	Red List status		Endemic to Europe?	Endemic to EU 27?
		Europe	EU 27		
Colletidae	<i>Colletes punctatus</i>	EN	EN	No	No
Colletidae	<i>Colletes sierrensis</i>	EN	EN	Yes	No
Melittidae	<i>Dasygoda frieseana</i>	EN	EN	Yes	No
Melittidae	<i>Dasygoda spinigera</i>	EN	EN	No	No
Melittidae	<i>Dasygoda suripes</i>	EN	EN	No	No
Andrenidae	<i>Flavipanurgus granadensis</i>	EN	EN	Yes	Yes
Halictidae	<i>Halictus carinthiacus</i>	EN	EN	Yes	No
Halictidae	<i>Halictus microcardia</i>	EN	EN	Yes	Yes
Halictidae	<i>Halictus semitectus</i>	EN	EN	No	No
Megachilidae	<i>Icteranthidium cimbiciforme</i>	EN	EN	No	No
Halictidae	<i>Lasioglossum breviventre</i>	EN	EN	Yes	No
Halictidae	<i>Lasioglossum laeve</i>	EN	EN	No	No
Halictidae	<i>Lasioglossum quadrisignatum</i>	EN	EN	No	No
Halictidae	<i>Lasioglossum sexmaculatum</i>	EN	EN	No	No
Halictidae	<i>Lasioglossum sexnotatum</i>	EN	EN	No	No
Halictidae	<i>Lasioglossum soror</i>	EN	EN	No	No
Halictidae	<i>Lasioglossum subfasciatum</i>	EN	EN	No	No
Halictidae	<i>Lasioglossum virens</i>	EN	EN	No	No
Melittidae	<i>Melitta melanura</i>	EN	EN	No	No
Apidae	<i>Nomada italica</i>	EN	EN	No	No
Apidae	<i>Nomada pulchra</i>	EN	EN	No	No
Megachilidae	<i>Osmia maritima</i>	EN	EN	No	No
Apidae	<i>Parammobatodes minutus</i>	EN	EN	No	No
Megachilidae	<i>Trachusa interrupta</i>	EN	EN	No	No
Andrenidae	<i>Andrena transitoria</i>	VU	VU	No	No
Apidae	<i>Biastes truncatus</i>	VU	VU	No	No
Apidae	<i>Bombus alpinus</i>	VU	VU	Yes	No
Apidae	<i>Bombus confusus</i>	VU	VU	No	No
Apidae	<i>Bombus distinguendus</i>	VU	VU	No	No
Apidae	<i>Bombus gerstaeckeri</i>	VU	VU	No	No
Apidae	<i>Bombus hyperboreus</i>	VU	VU	No	No
Apidae	<i>Bombus muscorum</i>	VU	VU	No	No
Apidae	<i>Bombus polaris</i>	VU	VU	No	No
Apidae	<i>Bombus pomorum</i>	VU	VU	No	No
Megachilidae	<i>Coelioxys elongatula</i>	VU	VU	No	No
Colletidae	<i>Colletes chengtehensis</i>	VU	EN	No	No
Colletidae	<i>Colletes dimidiatus</i>	VU	VU	Yes	Yes
Colletidae	<i>Colletes floralis</i>	VU	VU	No	No
Colletidae	<i>Colletes fodiens</i>	VU	VU	No	No
Colletidae	<i>Colletes impunctatus</i>	VU	VU	No	No
Colletidae	<i>Colletes moricei</i>	VU	VU	Yes	Yes
Colletidae	<i>Colletes perezi</i>	VU	VU	No	No
Colletidae	<i>Colletes pulchellus</i>	VU	VU	Yes	Yes
Halictidae	<i>Halictus leucabeneus</i>	VU	VU	No	No
Melittidae	<i>Melitta hispanica</i>	VU	VU	Yes	Yes
Melittidae	<i>Melitta kastiliensis</i>	VU	VU	Yes	Yes
Apidae	<i>Nomada noskiewiczi</i>	VU	VU	Yes	Yes
Halictidae	<i>Systropha planidens</i>	VU	VU	No	No
Andrenidae	<i>Andrena nanaeformis</i>	LC	VU	No	No



3.2 Status by taxonomic group

European bees belong to a number of different families as described in section 1.2. Table 5 presents the status of these species per family and sub-family.

Compared to the European proportion of threatened species (9.2%), it appears that the species in the families Melittidae and Colletidae represent a higher proportion of threatened species (18.9% and 12.8% respectively); while the species in the Megachilidae show the lowest levels of threat (1.1%). However, all the families include a very high number of Data Deficient species.

Looking at the sub-families can allow conclusions to be drawn in relation to some behavioural and ecological traits. Table 5 shows that there are 14 sub-families, although the Apinae are divided into corbiculate (pollen basket bees - *Bombus* sp. and the Honey Bee, *Apis mellifera*) and non-corbiculate (without pollen baskets). The sub-families that are most threatened are the Colletinae (32.1%), the corbiculate Apinae (23.2%), Dasypodainae (25%) and Melittinae (14.3%). The rest of the sub-families contain less than 5% of threatened species and some have no threatened taxa: Xylocopinae, Hylaeinae, Nomiinae and Nomioidinae.

For the Colletinae, Dasypodainae and Melittinae, the higher proportion of threatened species may be explained

by their relatively specialised foraging behaviours (Michez *et al.* 2008, Müller and Kuhlmann 2008) which could make them more susceptible to changes in their environment (Scheper *et al.* 2014). For the corbiculate Apinae, most of the bumblebees are quite unspecialised foragers, however they tend to be more abundant and diversified in colder climates, such as high mountains and boreal and arctic biomes, and have a relatively high vulnerability as their preferred habitats are much more susceptible to climate change (Williams *et al.* 2009, Rasmont *et al.* 2015).

The Near Threatened (NT) status was assigned mainly to the Halictinae (39), Nomadinae (22), and Megachilinae (10) species. This status was given to species that are clearly declining in large parts of Europe but not to the extent that would trigger the IUCN Red List Criteria thresholds. These species require further study as additional population data may clarify their extinction risk status further.

For the sub-families with no threatened species (Xylocopinae, Hylaeinae, Nomiinae and Nomioidinae), some of them are thermophilic, unspecialised foragers that appear to be benefiting from climate change. Some of the Xylocopinae (which include the carpenter bees) have been expanding their distribution for several decades and are clearly driven by climate warming (Roberts and Peat 2011, Terzo and Rasmont 2014).

With regards to the Data Deficient species, the group with the lowest number is the Dasypodainae (2 species) and the Nomiinae (4 species). On the other hand, the sub-families with the highest number of Data Deficient species are the Andrenidae (307 species), the Megachilinae (242 species)

and the non-corbiculate-Apinae (192 species). This could be the result of a number of reasons: poor taxonomic knowledge leading to insufficient sampling; the difficulty in sampling the species due to their intrinsic rarity (Nomadinae); or the lack of targeted surveying for certain species groups.

Table 5. IUCN Red List status (at the European level) of bees by family and subfamily*.

Order	Family	Subfamily	Total	CR	EN	VU	NT	LC	DD	% threatened
Hymenoptera	Andrenidae		455	3	5	1	7	106	333	2.0
		Andreninae	413	3	4	1	6	92	307	1.9
		Panurginae	42	0	1	0	1	14	26	2.4
	Apidae		561	3	12	10	27	200	309	4.5
		Apinae (corbiculate)	69	1	7	8	3	43	7	23.2
		Apinae (not corbiculate)	237	0	0	0	2	43	192	0.0
		Nomadinae	223	2	5	2	22	90	102	4.0
		Xylocopinae	32	0	0	0	0	24	8	0.0
	Colletidae		141	0	10	8	7	54	62	12.8
		Colletinae	56	0	10	8	5	25	8	32.1
		Hylaeninae	85	0	0	0	2	29	54	0.0
	Halictidae		307	0	11	2	45	105	144	4.2
		Rhopitinae	30	0	0	1	6	3	20	3.3
		Halictinae	266	0	11	1	39	95	120	4.5
		Nomiinae	6	0	0	0	0	2	4	0.0
		Nomioidinae	5	0	0	0	0	5	0	0.0
	Megachilidae		441	1	3	1	10	184	242	1.1
		Megachilinae	441	1	3	1	10	184	242	1.1
	Melittidae		37	0	5	2	5	14	11	18.9
		Dasypodainae	16	0	4	0	2	8	2	25.0
		Melittinae	21	0	1	2	3	6	9	14.3
Total*			1,942	7	46	24	101	663	1,101	4.0

*This table does not include species classed as Not Applicable (NA).

Coelioxys argentea (Least Concern). © H. Wallays.



Box 1: European bumblebees (*Bombus* spp.)

Compared to all other wild bees in Europe, bumblebees constitute the best studied group. Large sets of information are available allowing for comparison of species trends between different periods.

There are 68 species of bumblebees present across Europe which play a critical role in pollination. They allow plants to reproduce sexually and improve the production of crops, such as tomatoes, peppers and many other types of fruit, vegetables and seeds that make up human diets. Of the five most important pollinators of European crops, three are bumblebee species (Kleijn *et al.* unpublished data).

According to the European Red List of bees, 23.6% of *Bombus* species are threatened with extinction, and 4.4% are considered Near Threatened (Figure 5). Moreover, 45.6% of bumblebee species have a declining population trend, 29.4% are stable, 13.2% are increasing and 11.8% are unknown (Figure 6). Given the large amount of data available for these species, a relatively low proportion were classed as Data Deficient (8.8%).

Bumblebees are generally specially diversified and abundant in cold habitats such as mountain meadows, boreal taiga and Arctic tundra (Williams 1994, Goulson 2010). Thus, climate change, through rising temperatures and long periods of drought, is responsible for major changes in bumblebee habitat (Rasmont *et al.* 2015). For example, *Bombus hyperboreus*, the second largest bumblebee of Europe, listed as Vulnerable on the European Red List, is strictly associated with Arctic and Subarctic regions and only lives in the Scandinavian tundra and in the extreme north of Russia (Løken 1973). Climate change is likely to reduce the area of its habitat dramatically, therefore leading to population decline.

Changes in land use and agricultural practices that result in the loss of the species' natural environment also represent a serious threat to many bumblebees in Europe. The geographic range of the Critically Endangered *Bombus cullumanus* has shrunk enormously in the last ten years following habitat fragmentation and changes in farming practices which involve removing clovers – its main forage (Rasmont *et al.* 2005). As a consequence, its population has declined by more than

80% over the last decade. Previously widespread, it now only occurs in a few scattered locations across Europe.

Europe's largest bumblebee, the Endangered *Bombus fragrans*, is also seriously threatened by the intensification of agriculture, which is destroying areas of its native habitat in the steppes of Ukraine and Russia.

Measures such as increasing the margins and buffer strips around agricultural fields that are rich in flowers and wildlife, and the preservation of grasslands, could be effective tools in alleviating the rapid decline in bumblebee species (Scheper *et al.* 2013). Such interventions can provide bees with forage and may help underpin support for diversity of pollinators such as bumblebees.

Figure 5. IUCN Red List status of *Bombus* spp. in Europe.

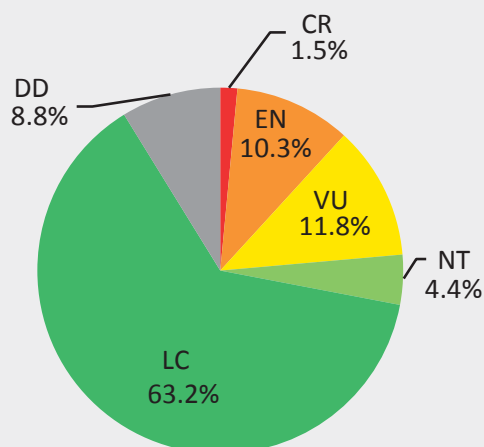
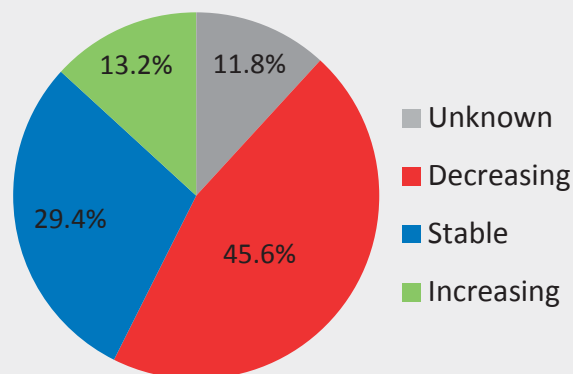


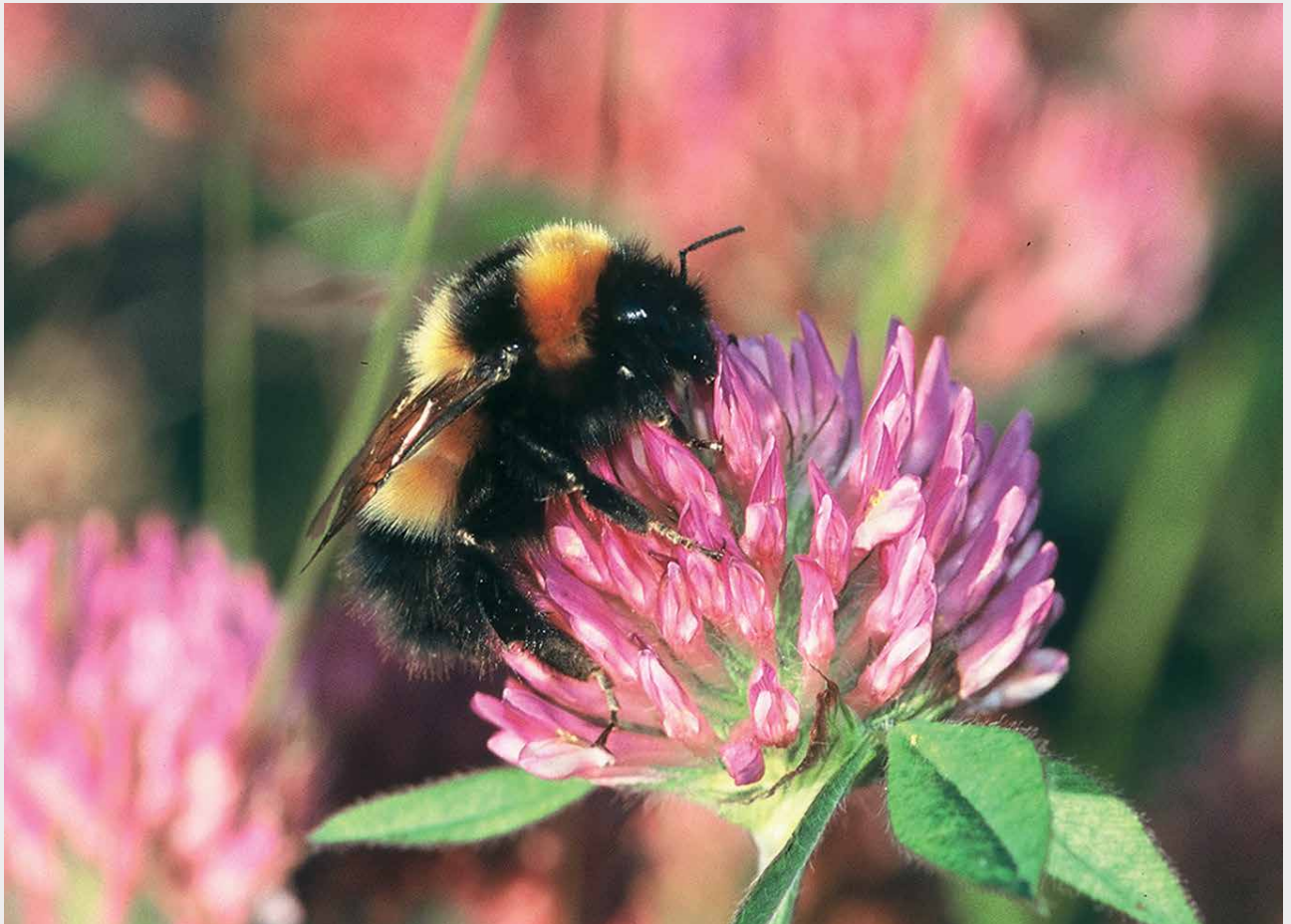
Figure 6. Population trends of *Bombus* spp. in Europe.



Bombus cullumanus (Critically Endangered). © P. Rasmont.



Bombus hyperboreus (Vulnerable). © G. Holmström.



Box 2: The Honey Bee (*Apis mellifera*)

The Honey Bee *Apis mellifera* is assessed as Data Deficient on the European Red List. The species is known to have a native distribution throughout much of Europe (except Iceland, the Faeroe Islands, the Azores, and northern Scandinavia), with numerous subspecies described across its native range. However, it is not known whether the species in Europe currently still occurs in the wild, due to the introgression of managed and feral colonies with wild colonies and the fact that the wild population may not be self-sustaining (De la Rúa *et al.* 2009, Jaffé *et al.* 2010, Moritz *et al.* 2007, Pinto *et al.* 2014).

Some colonies that are found in the wild (e.g., in tree cavities) may contain species that have escaped from a managed colony, and hence these colonies cannot be considered as wild. In addition, as these species are not wild, they may not survive to reproduce.

It is important to state that a managed bee population cannot be considered as wild, as in most areas there have been hundreds of years of selection by humans for positive traits, such as producing better quality honey or less aggressive bees. Most *A. mellifera* colonies are not considered to be self-sustaining as veterinary treatments against the mite *Varroa destructor* (and other parasites) are often provided.

Apis mellifera (Data Deficient). © S. Falk.



The impact of threats such as the transfer of pathogens and parasites from managed and feral colonies to wild colonies, detrimental bee-keeping practices, loss of forage and nesting habitat, invasive alien species, the lack of pest control, and other anthropogenic impacts such as the use of agrochemicals may have resulted in the loss of wild populations (Blacquiere *et al.* 2012, De la Rúa *et al.* 2009, Fürst *et al.* 2014, Henry *et al.* 2012, Kremen *et al.* 2002, Moritz *et al.* 2010, Rortais *et al.* 2010, Muñoz *et al.* 2014a, Muñoz *et al.* 2014b).

Numerous studies indicate that *A. mellifera* has undergone significant declines in Europe (Potts *et al.* 2010); however, it is not clear if they refer to population reduction of wild or managed colonies although there are studies clearly documenting shifts in the number of managed hives (Jaffé *et al.* 2010).

The Honey Bee is therefore assessed as Data Deficient until further research enables us to differentiate between wild and non-wild colonies in order to determine the conservation status of the species in the wild. Research is also required to understand the impacts of the threats to the species at the colony level, in particular from *V. destructor* and its associated pathogens, malnutrition and herbicides, pesticides and fungicides. Action should be taken to prevent further declines of the species in Europe.

Apis mellifera (Data Deficient). © P. Neumann.



3.3 Spatial distribution of species

3.3.1. Species richness

The geographic distribution of bee species richness in Europe is shown in Figure 7 and is based on all bee species (1,965 species). Southern Europe, and particularly the Mediterranean climate region, is the area with the highest species richness. Richness declines gradually towards more northern latitudes and north-eastern Europe. The relatively low bee diversity observed on the Balkan Peninsula north of Greece is almost certainly an anomaly caused by under sampling in this area. For southern and eastern Europe generally, little bee distribution data is available so the patterns observed in Figure 7 should be treated with great caution.

3.3.2. Endemic species richness

In Figure 8 the richness of endemic bee species in Europe is shown and is based on 400 endemic species. While endemism is relatively low in temperate parts of Europe because many species have large ranges extending far

into Asia, the situation is different in southern Europe with a high number of endemic bee species. As already mentioned in section 3.3.1, the apparently low bee endemism in large parts of the Balkan Peninsula may be the result of under sampling. The Mediterranean and Macaronesian islands have a number of range-restricted endemic bees, although these regions do not show up on the map because typically each particular island only harbours a few of them.

An endemic species is defined here as having its global range restricted to European political boundaries. Bees, in common with other taxa are not restricted by administrative borders so this definition is in conflict with biogeographically defined regions of endemism specifically in south-western and south-eastern Europe. As many bee species, for example in the Iberian or Balkan Peninsulas, also occur in neighbouring parts of north Africa and Asia Minor respectively. They are not considered here as endemic, although they are endemic to the respective region. Hence, the number of bee species with small ranges is considerably higher in south-western and particularly south-eastern Europe than shown in Figure 8.

Figure 7. Species richness of European bees.

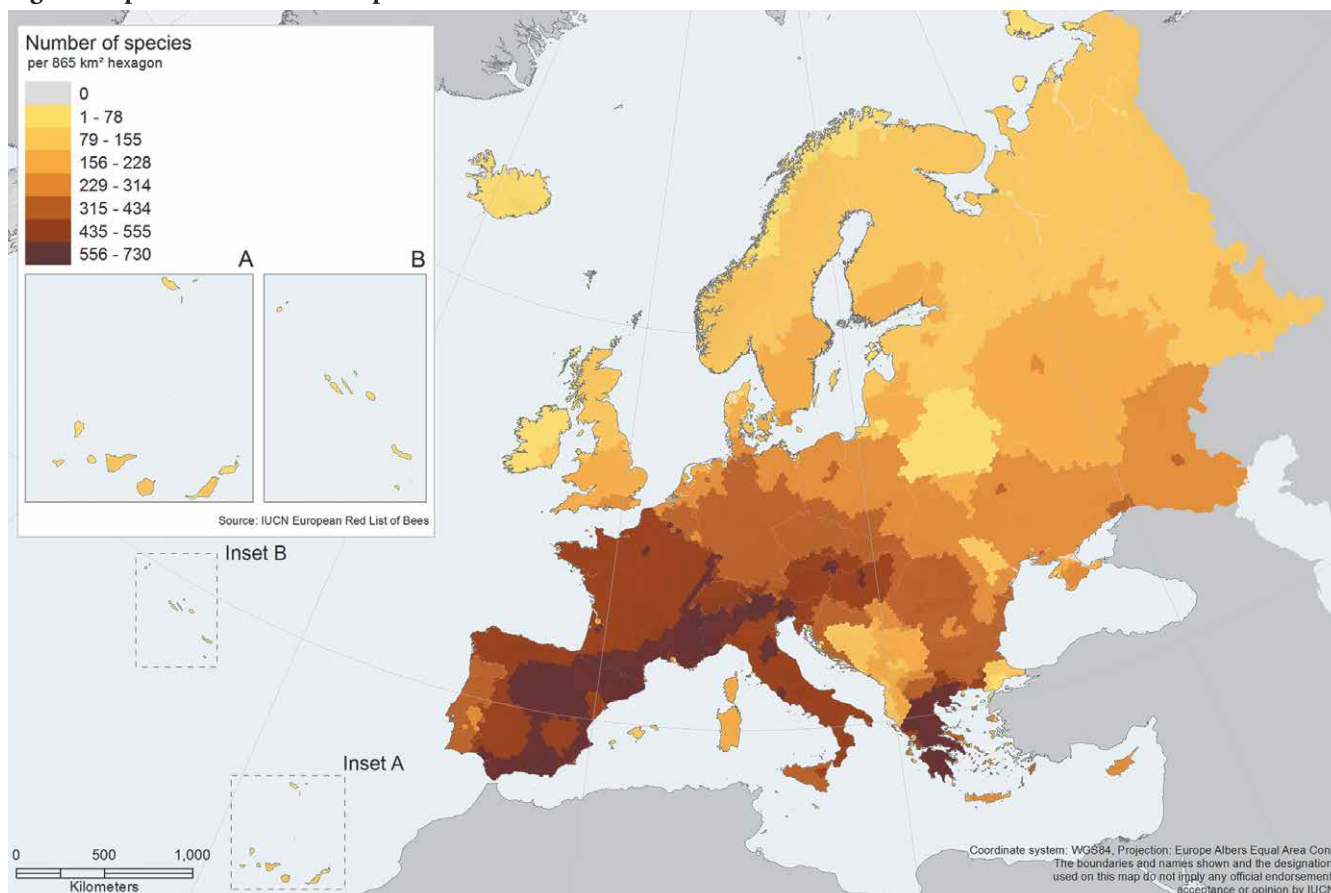
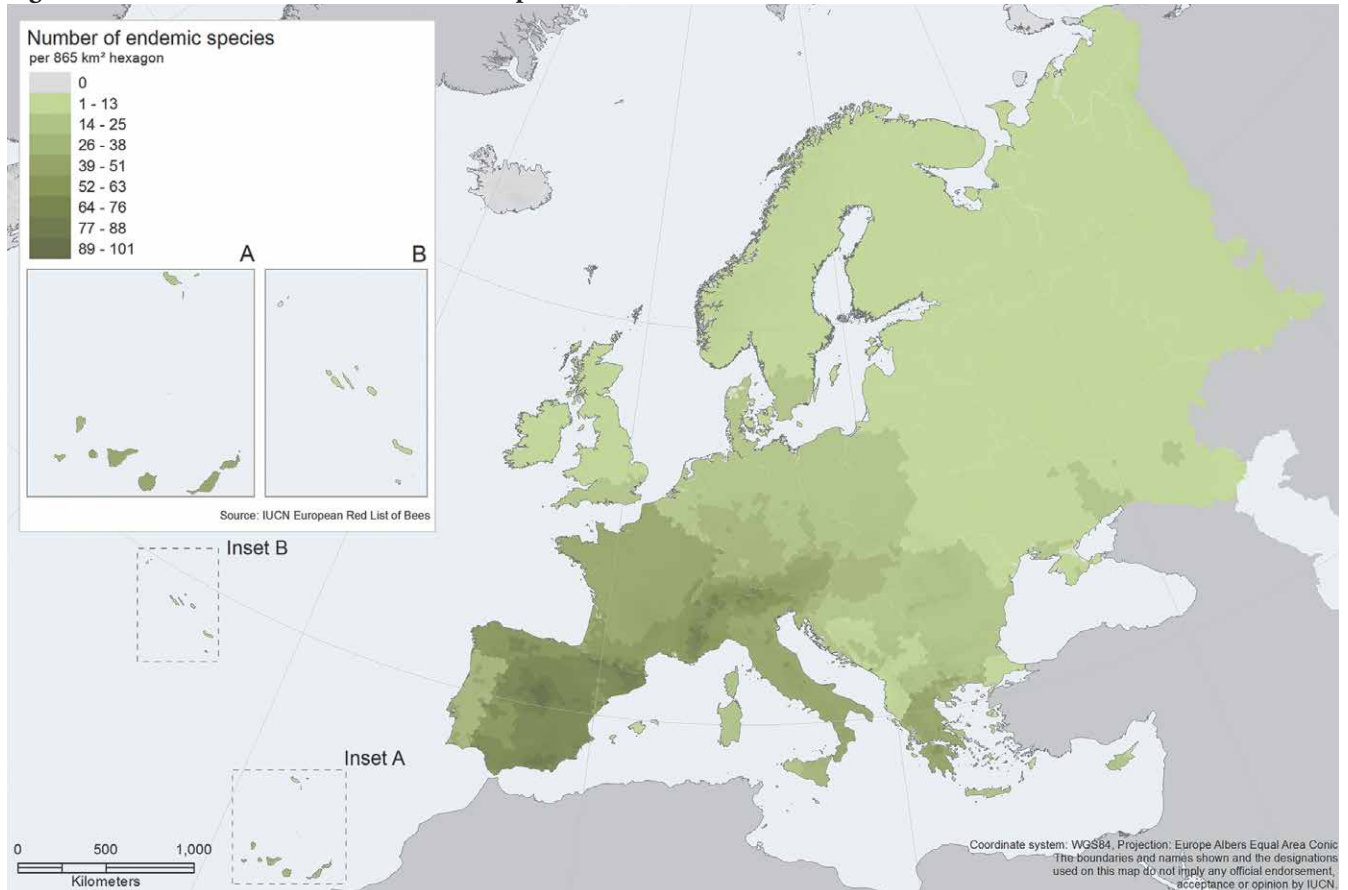


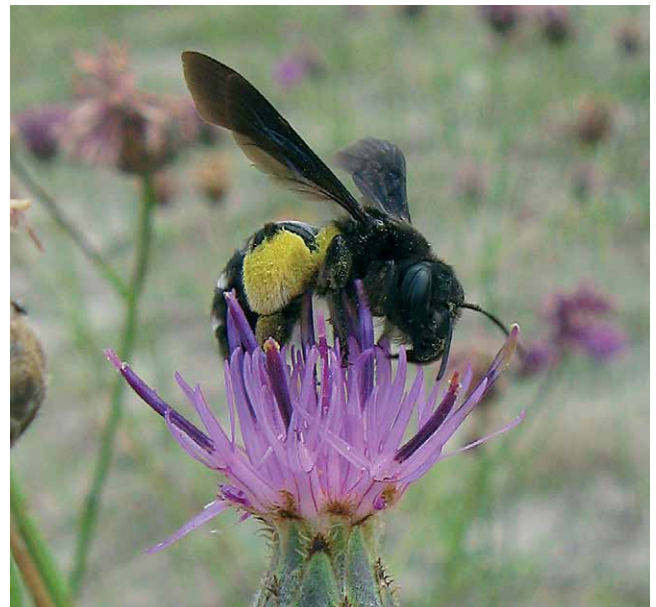
Figure 8. Distribution of endemic bees in Europe.



3.3.3. Distribution of threatened species

In Figure 9, the richness pattern of threatened bee species in Europe, which considered 77 threatened species, is illustrated showing the greatest concentration in south-central Europe eastwards to Crimea while large parts of southern Europe seem to have low numbers of threatened bees. This pattern is different from, and contrasts the picture of overall species diversity (Figure 7) and the distribution of endemics (Figure 8). In part, this may be because there is a large number of species that have been classified as Data Deficient (1,101 bee species, 56.7% of the total European fauna, Table 3 and Figure 3), of which the vast majority appear to be restricted to southern Europe and these have not been considered here. However, given that Mediterranean Europe has undergone a large-scale transformation in land use in the last few decades, it is very likely that many of the range restricted and specialised bee species there are actually threatened. Thus, Figure 9 is misleading regarding the situation in southern Europe and reveals an urgent need for further research and recording in these areas.

Andrena magna (Endangered). © A.V. Fateryga.



3.3.4. Distribution of Data Deficient species

In Figure 10 the richness of Data Deficient species is presented and is based on the total number of Data Deficient species (1,101 species). The pattern is very similar to the map showing general bee richness (Figure 7). This illustrates the deep divide in available

Figure 9. Distribution of threatened bees in Europe.

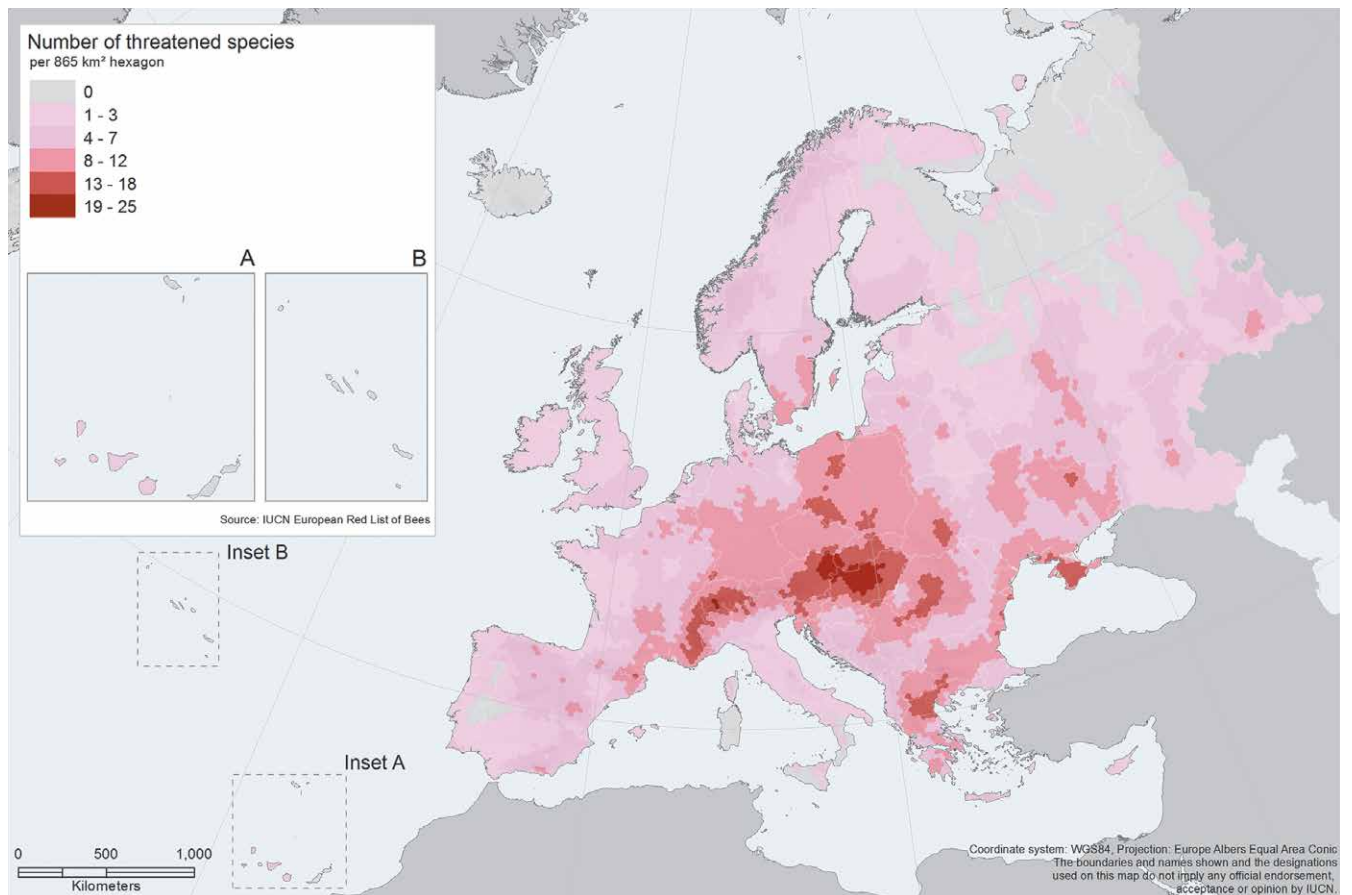
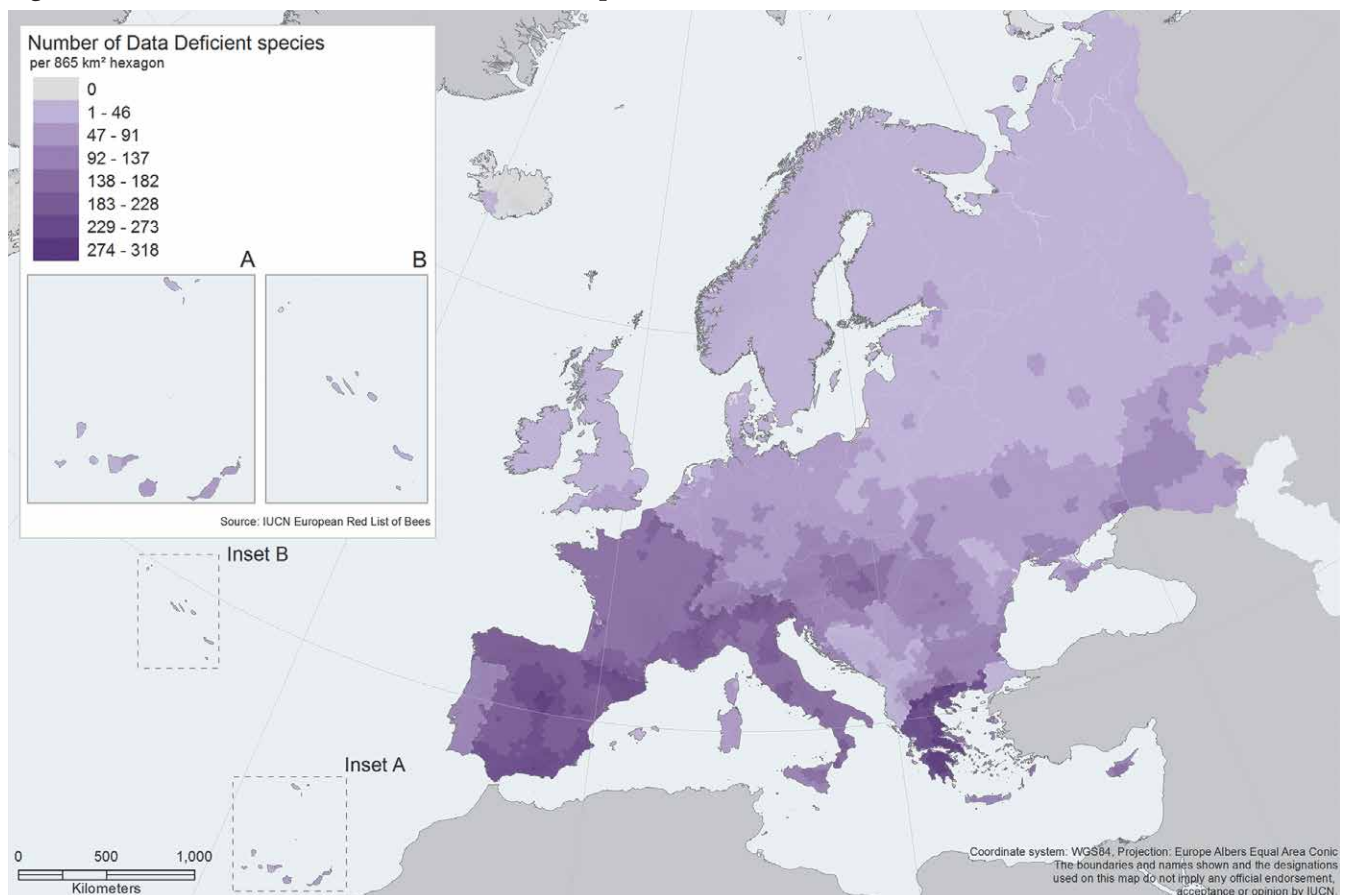


Figure 10. Distribution of Data Deficient bees in Europe.



information on distribution and life history data between the relatively well known, but species-poor, northwest of Europe, and particularly the centre of bee diversity in the Mediterranean region that harbours the majority of the fauna. This deficiency may be due to insufficient, or even complete lack of, taxonomic expertise for large parts of the European bee fauna. Such taxonomic deficits could be overcome by training the next generation of taxonomists, investing in carefully targeted faunistic surveys and better mobilising existing data from museum collections.

Eucera nigrilabris (Data Deficient). © J. Devalez.



3.4 Major threats to bees in Europe

With the majority (56.7%) of European bee species being listed as Data Deficient, any overview of the threats to the continental apifauna will necessarily be incomplete. However, for conservation and management of bee diversity to be undertaken effectively, it is critical to have a clear understanding of taxonomy and ecology of the species present. National governments, through the Convention on Biological Diversity, recognise the existence of a taxonomic impediment and, through the Darwin Declaration, intend to address the situation (Environment Australia 1998). This shortfall in taxonomic expertise is very apparent in our understanding of bees. A major threat to effective deployment of conservation actions for the bees of Europe is an inability to understand and identify the species present and to monitor the state of populations effectively.

According to the European Red List, 212 species had no threats identified, while for 1,067 species threats remain unknown. Identified threats for the remaining species

(663) are presented below, and a summary of the relative importance of the different threatening processes is shown in Figure 11.

Agricultural expansion and intensification

Many of the environmental threats to bee diversity are associated with modern agriculture and, in particular, shifting agricultural practice and the increasing intensification of farming (Figure 11). These threats include those related to intensive arable farming (loss of uncultivated habitats and widespread use of insecticides and herbicides (Sydenham *et al.* 2014, Gill and Raine 2014)), livestock farming (resulting in grazing and stocking regimes that are damaging to grasslands and fragile Mediterranean ecosystems) (Vulliamy *et al.* 2006) and the continued presence of commercial timber plantations (Navarro-Cerrillo *et al.* 2013).

According to the European Red List, 366 species are affected by changes in agricultural practice, which can lead to large scale habitat loss and habitat degradation, especially in temperate regions. Shifts from grassland hay cropping regimes to the more intensive silage production (i.e. late season to early season cropping) or increased grazing, has resulted in large scale losses of herb-rich grasslands e.g., 97% loss of enclosed semi-natural grasslands in England and Wales (Bullock *et al.* 2011) and 97-99% of the historically managed grassland in Sweden (Dahlström *et al.* 2008). Loss of season-long flowering impacts particularly strongly on long-lived social insects, especially bumblebees (*Bombus* spp.), and in more intensively farmed regions of Europe, bumblebees are especially susceptible (Carvell *et al.* 2006, Rundlöf *et al.* 2008). The loss of semi-natural grasslands also negatively impacts on localised and specialised solitary species (e.g., *Andrena hattorfiana* and *A. humilis* in Sweden) (Franzén and Nilsson 2004).

In other parts of Europe, traditional land use has been abandoned, allowing for development of scrub and ultimately woodland. This is especially true in places that are generally unsuitable for more intensive farming, and in places such as the Baltic States it is abandonment, rather than habitat fragmentation, that is the key driver of species composition in semi-natural grasslands (Dauber *et al.* 2006). 331 non-threatened species and 35 threatened species are regarded as under threat from agricultural expansion, intensification and shifts in agricultural practice, and 307 non-threatened species and 16 threatened species are regarded as under threat from

livestock farming (often in conjunction with an increased susceptibility to fire in the Mediterranean region).

Pollution, pesticides and herbicides

Among the many threats linked to modern agriculture is the widespread use of agri-chemicals. The results of the European Red List show that 252 species of non-threatened bees, and 7 threatened bee species are regarded as threatened by agricultural and forestry effluents; either by direct contact, or via a sub-lethal effect on the bees themselves (mainly due to insecticide application) or by damaging the floral resources (mainly due to herbicide application) on which bees depend.

The pesticide story is complex, but studies have shown that exposure to neonicotinoid pesticides can lead directly to the loss of honey bees (e.g., Tapparo *et al.* 2012, Pisa *et al.* 2015), and commercial *Bombus* in the US (e.g., Gradish *et al.* 2010). Exposure to sub-lethal doses of neonicotinoids have been linked with increased levels of the gut pathogen *Nosema* in honey bees (Pettis *et al.* 2012) and colony loss by impairing overwinter survival in honey bees (Lu *et al.* 2014). Elston *et al.* (2013) report that sub-lethal effects of thiamethoxam, a neonicotinoid pesticide, in conjunction with propiconazole, a DMI fungicide, affect colony initiation in bumblebee (*Bombus terrestris*) colonies (see also Godfray *et al.* 2014).

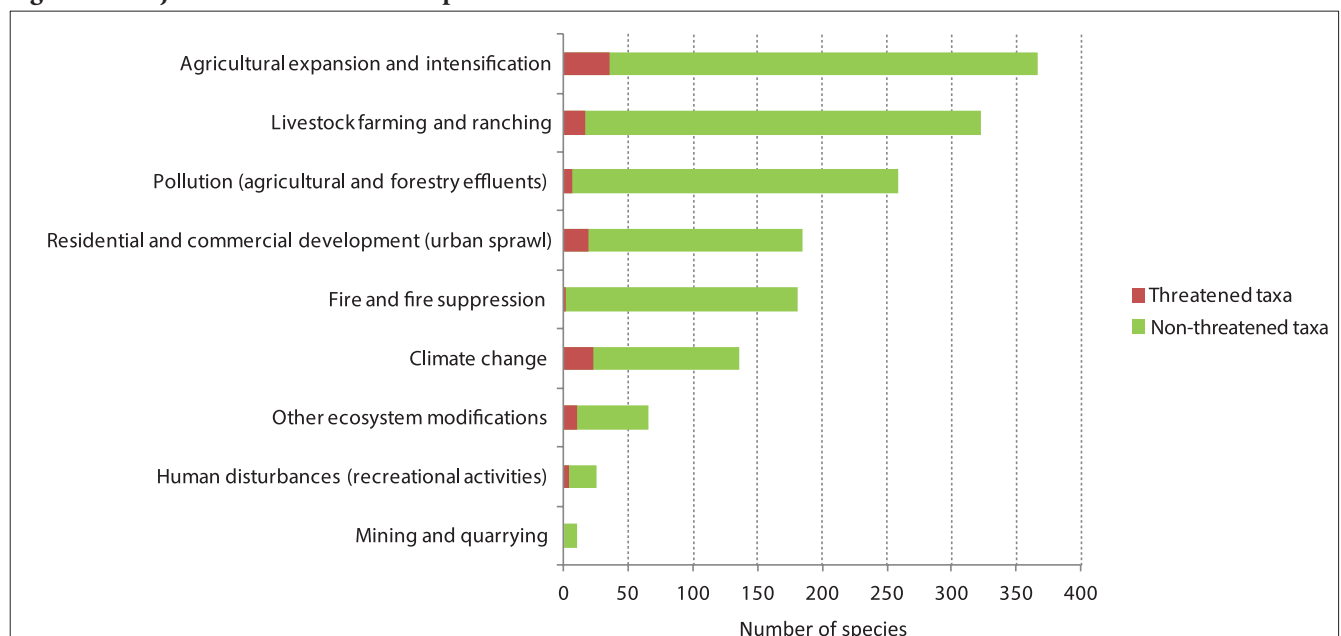
A number of laboratory studies (e.g., Goulson 2013, Sandrock *et al.* 2014) describe the sub-lethal effects of neonicotinoid pesticides on some species of bees, and growing evidence from field studies indicates that levels of

systemic pesticides (neonicotinoids and fipronil) that have been documented in the environment are sufficient to cause adverse impacts on a wide range of non-target organisms, including bees (Pisa *et al.* 2015). Traits such as body size, foraging range, food storage, etc. vary highly between bee species and as a result, so does the potential sensitivity to the direct or indirect effects of pesticides (Williams *et al.* 2010). It seems clear that honey bee traits make them more robust than other wild bee species to resist the effects of pesticides (Desneux *et al.* 2007). Nevertheless, our knowledge about the effects of pesticides is based primarily on honey bees. Gill and Raine (2014) have, however, shown that prolonged exposure of sub-lethal doses of Imidachloprid (a neonicotinoid) affects natural foraging behaviour of commercially reared *Bombus terrestris* in the field.

Herbicide application can also impact negatively on bee diversity, as it can reduce the availability of flowers on which bees depend and delay the flowering so the timing between the period when food is most needed by pollinators and food availability is disrupted (Boutin *et al.* 2014). Herbicide application can have a significant local effect on bees, especially those species that are specialised pollen foragers (Nabhan and Buchmann 1995).

Increasing application of Nitrogen-based fertilisers is typical of the widespread intensification of agriculture over much of the continent. Fertiliser use, in addition to encouraging the growth of the target crops, also promotes rank grassland, low in flowering plants (especially Fabaceae) (Wilson *et al.* 1999) and poor for many bees, especially some *Bombus* species and Fabaceae specialists.

Figure 11. Major threats to bees in Europe.



Residential and commercial (including coastal infrastructure) development

Urban sprawl and infrastructure development have continued apace in the late 20th and early 21st century, with the expansion of cities, ports, tourist resorts and associated recreational areas. Global trade in goods grew by an average of 6.9% a year between 1997 and 2006 and sea ports in northern Europe have been enacting major extension projects to accommodate this (e.g., EUROMAX-Terminal in Rotterdam with an expansion in area of 1,000 ha)(EEA 2006, Povedans 2007). Mass tourism in coastal regions has seen an increase in both the size of the local population and number of hotels (e.g., Malaga; Costa del Sol, Spain saw an increase in the number of hotels from 150 to 300 between 1983 and 2000 and a rise in population of 71.6% from 1950-2000) (Segreto *et al.* 2009). It is estimated that by 2020 there will be some 350 million tourists visiting the Mediterranean coastal region alone (Davenport and Davenport 2006). Along the Mediterranean coasts of Spain and France and all along the coast of mainland Italy, 75-80% of the coastal sand dunes have been destroyed by tourism, urbanisation and industry. Sand dune systems in Greece and Portugal are under growing urbanisation pressures as well (van der Meulen and Salman 1996). The increasing numbers of tourists in the Costa del Sol has caused an expansion in the number recreational facilities, from tennis courts, marinas and camping grounds to golf courses (many of which are coastal) (Anonymous 2006). These threatened systems support bees such as *Osmia balearica* and *Osmia uncinornis* (Haeseler 2008).

Tourism associated with skiing is an extremely important economic factor in the Alpine regions of Europe (Abegg *et al.* 1997, Elsasser and Messerli 2001), and the area affected by ski pistes or by infrastructure development related to tourism is still increasing (Wipf *et al.* 2005). Work for this Red List suggests that highly restricted, threatened montane bees such as *Bombus brodmannicus* are believed to be at risk from future skiing-related development. In all, some 166 non-threatened and 19 threatened bee species are regarded as under threat from expanding urban sprawl and infrastructure development, and 21 non-threatened species and 4 threatened species are regarded as under threat from human disturbances associated with tourism.

Other ecosystem modifications, including mining and quarrying

In low lying coastal areas where flood risk from tidal surges is a potentially damaging threat to human life and livelihood, hardening and strengthening of sea walls, and the creation of

new defences (such as in the Dutch Delta area) have impacted on coastal habitats, especially saltmarshes. Maintaining the existing coastline generally will cause considerable loss of saltmarsh (Cooper *et al.* 2001) with direct impact on specialised bee species such as *Colletes halophilus* (a European endemic with a restricted range).

Priority habitats with sandy soils in Atlantic Europe include areas that support lowland heathland (a temperate dwarf shrub community). These globally important habitats have been under threat for many years now from urban expansion, widespread plantation of commercial forestry and mineral extraction (Rose *et al.* 2000, Hooftman and Bullock 2012). Urban development can impact habitats through physical degradation and fragmentation, road building, pollution, increased fire risk and waste disposal through landfill (Anonymous 2013). Ten non-threatened species are regarded as under threat from mining and quarrying, and 56 non-threatened species and 10 threatened species are regarded as under threat from a variety of other modifications to ecosystems.

Fire and fire susceptibility

181 species appear to be threatened by fires. Within the Mediterranean basin, between 1980 and 1990, an average of 700,000 ha of phryganeic shrublands, heathland and grasslands, were burnt each year by a total of some 60,000 fires, with Greece, Spain, Portugal and France accounting for more than half of this total (Condé and Richard 2002). Greater fire frequencies and fire extent as a result of climate change have been noted in the Mediterranean basin (Pausas and Abdel Malak 2004). In the exceptionally hot and dry summers in the early 21st century, large fires were both widespread and common in the Mediterranean basin. Although lightning is known to be a cause of some fires, it is now considered that about 95% of the fires in the Mediterranean area are of human origin (Condé and Richard 2002). Whilst fire is an important element in maintaining Mediterranean shrubland, an increased frequency of fire in Mediterranean shrubby ecosystems allied with grazing of immediate post-fire communities can decrease bee diversity (Potts *et al.* 2003). 179 non-threatened species and two threatened species are regarded as under threat from an increased susceptibility to fire.

Climate change (including habitat shifting and alteration, droughts and temperature extremes)

Changes in climate are also considered to be an important driver of increased extinction risk and 136 bee species appear to be threatened by it. In the steppe



regions of eastern Europe, an increase in summer rainfall (Klimenko 1994, Shahgedanov 2002) has led to habitat conversion from dry xeric grasslands to meadow and scrub (Penksza *et al.* 2003) to the detriment of bee species (e.g., *Bombus fragrans*) that are restricted to these dry habitats (Radchenko 2009). Studies by Maracchi *et al.* (2005) and Olesen and Bindi (2002) also show that climatic change in Europe will lead to more widespread and prolonged heat waves and summer droughts and an increase in temperature across the Boreal, Arctic and Alpine regions will severely impact the vegetation composition. This is already having an effect on the species associated with these habitats, as the bumblebee species of these biomes come under increased threat of extinction (Callaghan *et al.* 2004, Odegaard *et al.* 2009, Rasmont *et al.* 2015). The European Red List shows that

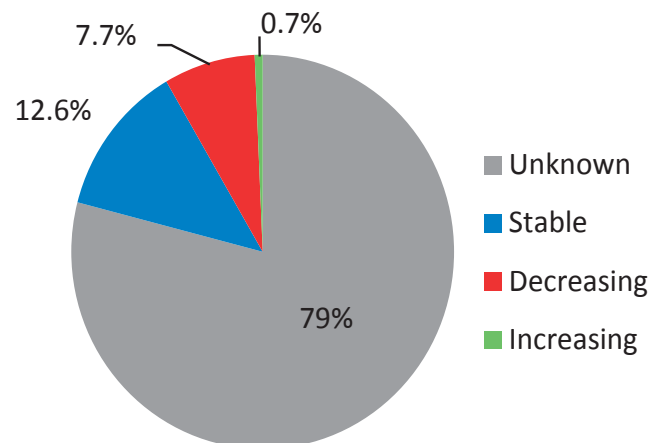
113 non-threatened species and 23 threatened species are regarded as threatened by climate change.

3.5 Population trends

Documenting a species population trend provides key information when assessing its Red List status. As part of this process, the species' overall populations were assessed as declining, stable, increasing or unknown. 7.7% (150 species) of Europe's bee species are thought to be in decline, while 12.6% of populations are considered stable (244 species) and 0.7% (13 species) are increasing (Figure 12). As very little population trend data exists from most European countries, 79% of species (1,535 species) have unknown population trends.



Figure 12. Population trends of European bees.



3.6 Gaps in knowledge

Taxonomic impediment

The bee Red List resulted in 56.7% of species being Data Deficient in Europe (Figure 3). Many taxa of solitary bees, like the Andrenidae, non-cirbiculate Apinae and Nomadinae, still require basic taxonomic research before they can be classified as other than Data Deficient. While the Andrenidae represents 23.6% of bee species diversity in Europe and pollinate an important number of plants, including crops, it remains unknown how many species there are within this diverse group.

Bee systematics (the science of determining the relationships between species) is relatively poorly supported in Europe (and even worse in the developing world) compared to North America. There is no equivalent of research funding at the European level to the National Science Foundation in USA or the taxonomic initiative in Sweden (<http://www.artdata.slu.se/>). A European wide initiative to promote bee systematic research is essential in order to determine how many species there actually are. This is the basic requirement for conserving the patrimony of species diversity.

A second aspect of the taxonomic impediment is the lack of taxonomic expertise. Unfortunately, the community of European bee taxonomists has been markedly reduced during the second part of the last century. There is consequently a unique wealth of publications about bees in Europe but very few address the basic systematic questions on a broad scale. Many of the modern taxonomists turned to more applied, fundamental or local approaches of systematics and therefore lasting taxonomic questions about the taxa at broader scales have not been addressed. An illustration of the deficiency, is that there is no European equivalent of the Michener *et al.* (1994) key for the North American bees. At species level, many taxa like the genera *Megachile* and *Andrena*, or the tribes Anthophorini, Eucerini and Nomadini still need basic taxonomic research.

Finally, a review of European bee diversity based on new molecular tools will help reveal cryptic species such as those that were shown to exist for bumblebees in Europe (see Lecocq *et al.* 2014) and the halictid bees of North America (Gibbs 2009).

National monitoring and survey

Reviewing published checklists (country and continental level), the national records and the National Red Lists

provides an insightful overview of the available local resources. While precise information on bee fauna (species number and species distribution) are available for countries like Sweden, the Netherlands, Belgium, UK, Germany or Switzerland, south eastern European countries like Albania, Greece or Bulgaria are less well covered.

Monitoring has to be fuelled by data from long-term surveys. These kinds of surveys help us understand the population dynamics of species and how they can shift in response to environmental changes. The few studies that provide long term data on bees in Europe are very useful. For example Dupont *et al.* (2011) conducted a survey of the bumblebee community on red clover. Of twelve *Bombus* species that were observed in the 1930's, five of them were not recorded during the contemporary re-survey study. The latter were all long-tongued, late-emerging species which are specialised on long corolla flowers like red clover. Long-tongued bumblebee species showed consistent and dramatic declines in species richness and abundances throughout the flowering season of red clover, which is in decline in Europe, while the short-tongued species were largely unaffected. These local results help us to understand the pattern of decline observed in bees. Bommarco *et al.* (2011) observed the same tendencies in Sweden.

Conservation of European bees would massively benefit from a systematic continental surveillance programme to determine the occurrence and abundance of key species and communities. This also requires the digitisation of data from experts and specimens in national collections, especially in the southern and eastern countries.

Stelis annulata (Data Deficient). © D. Genoud.



4. Conservation measures

4.1 Biodiversity protection in Europe and the EU

European countries and EU Member States are signatories to a number of important conventions aimed at conserving biodiversity, including the 1979 Bern Convention on the Conservation of European Wildlife and Natural Habitats, and the 1992 Convention on Biological Diversity.

Through the CBD, the Strategic Plan 2011-2020 was established, which includes 20 targets (Aichi Targets) that are guiding the work of the CBD and all the other biodiversity conventions. In particular, Target 12 focuses on preventing the extinction of known threatened species and improving their status.

The Bern Convention is a binding international legal instrument that aims to conserve wild flora and fauna and their natural habitats and to promote European cooperation towards that objective. It covers all European countries and some African states.

Also at the Pan European level, European countries across the continent endorsed the Pan-European 2020 Strategy for Biodiversity (UNEP 2011), which refocuses efforts to prevent further loss of biodiversity in the Pan European region and provides a European mechanism for supporting the implementation of the global Strategic Plan for Biodiversity.

EU nature conservation policy is based on two main pieces of legislation - the 1979 Birds and the 1992 Habitats Directives. The main aim of the nature directives is to ensure the favourable conservation status (see Box 3) of the habitats and species found in the EU. One of the main tools to enhance and maintain this status is the Natura 2000 network of protected areas, which currently contains over 27,000 terrestrial and marine sites, covering almost a fifth of the EU land areas as well as substantial parts of the surrounding seas (IEEP 2011).

In addition the EU has committed to a long-term (2050) vision and mid-term headline target for biodiversity, which is '*To halt the loss of biodiversity and the degradation of ecosystem services in the EU by 2020 and restore them in*

so far as possible, while stepping up the EU contribution to averting global biodiversity loss'. This target underpins the EU Biodiversity Strategy 2011-2020.

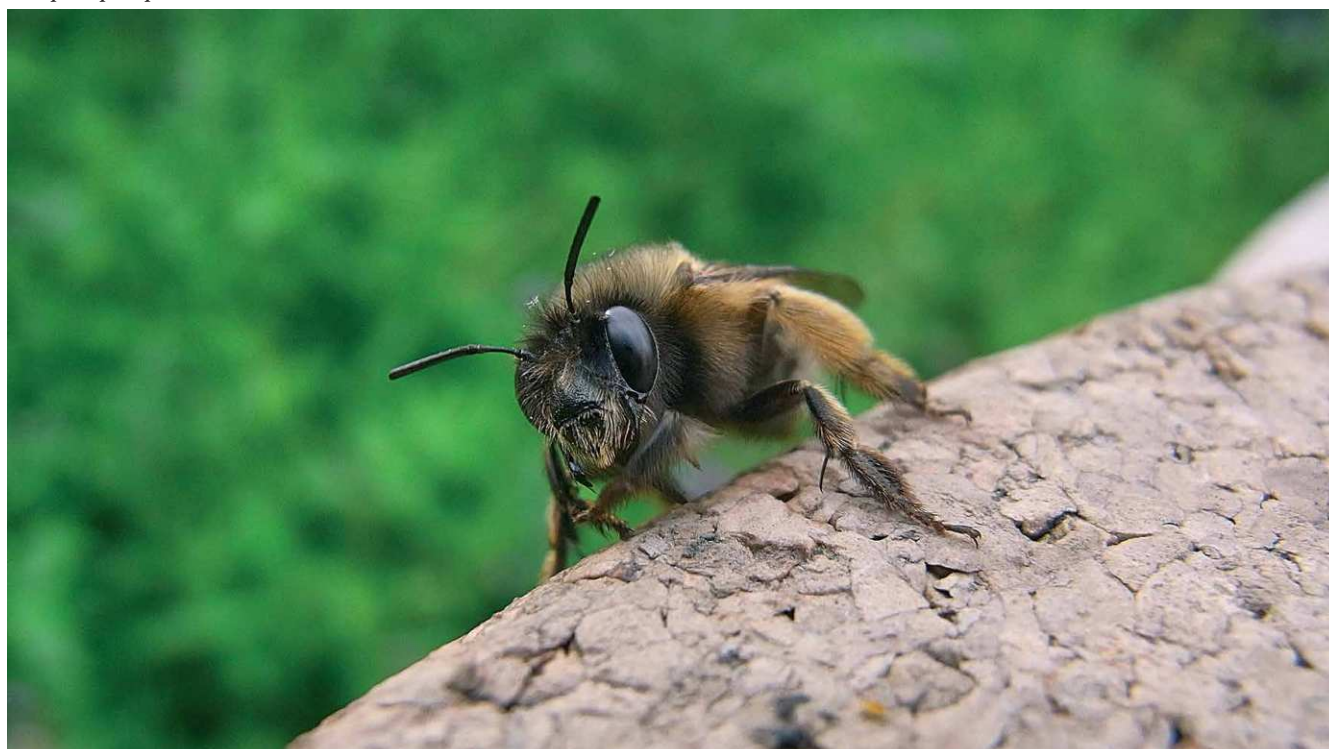
The establishment of these policy instruments indicate the high political commitment to biodiversity and the need to monitor the status of biodiversity as to assess progress towards meeting conservation objectives and targets.

4.2 Conservation of bee species in the EU

Many of the existing conservation actions are about expanding floral resources, shelter and nest sites for pollinators. There is no global or European action focusing on the conservation of bees in particular. Protected areas, mass flower crops and agri-environment schemes (including organic farming) have been identified as three broad complimentary mitigation strategies for pollinators (including bees) (Wickens *et al.* 2013). Each strategy differs in temporal and spatial coverage but all potentially offer significant benefits to pollinators.

The Natura 2000 network of protected areas almost covers 18% of the EU territory (IEEP 2011). Many rare and scarce species are only found within these sites (e.g., Iserbyt 2009). They have been lost from the wider landscapes and so protected areas provide an essential tool in conservation even if these sites were never designated based on the presence of particular bee species. The results of the Red List assessment indicate that 30 threatened species and 41 Near Threatened species were recorded in at least one protected area.

Mass flowering crops, such as oilseed rape, promoted as part of the EU Common Agricultural Policy (CAP), and also increasing in area through rising demands for biofuels under the renewable fuel Directive, may help support populations of generalist pollinators like common bumblebees (e.g., Westphal *et al.* 2009). Moreover, late-season mass-flowering of red clover can also promote bee diversity (Rundlöf *et al.* 2014). The main limitation of this is the short flowering period and limited number of bee species able to forage on these resources. If the mass flowering crop is the main resource through the flight period of the bee species, it cannot



support the production of additional offspring (Westphal *et al.* 2009). Furthermore, negative consequences are possible for specialist or mismatched species and there is potential to distort plant-pollinator interactions in agro-ecosystems (Diekotter *et al.* 2010). Finally, there is still the question of whether mass flowering crops, which draw in bees from the surrounding landscape, increase the risk of exposure to pesticides.

Agri-environment schemes (AES) were introduced within the CAP in the late 1980s and today are developed as part of the EU Rural Development Programmes (RDPs) which pays farmers to provide a range of environmental services. One option available in AES is the establishment of sown wildflower strips on farmland, which can in some cases promote bee abundance and species diversity (Carvell *et al.* 2006, Scheper *et al.* 2013); however they are poor for conservation of rare species (Korpela *et al.* 2013) which is unsurprising as they are not designed for this purpose. A meta-analysis of AES interventions across Europe (Scheper *et al.* 2013) showed that several interventions are effective in locally supporting bees: sown flower margins, naturally regenerating margins, arable organic farming, and low input meadows. Studies synthesising global evidence on local and landscape factors affecting bees have concluded that benefits can be derived from: maintaining patches of semi-natural habitat in the agroecosystems (e.g., Ricketts *et al.* 2008);

organic or low input farming compared to conventional farming (e.g., Kennedy *et al.* 2013); and small, mixed crop fields with uncultivated boundary features compared to large, monocultures with little boundary vegetation (e.g., Kennedy *et al.* 2013).

In general, bee species diversity, and especially common generalist species, can be promoted in different kinds of landscapes by ensuring a variety of good quality local habitat (Kleijn *et al.* 2011). In order to improve the status of habitat specialist species, a mosaic of habitats containing the specific forage and nesting resources needed by these bees is required. While local studies indicate that there are some benefits for bees from protected areas, AES and mass flowering crops, many questions remain regarding which is most effective for different species of bee and how these can be integrated at the landscape level to provide the best conservation support for bees and other pollinators.

4.3 Conservation of bee species at the national level

Some European countries have developed specific actions at the national level in order to enhance bee populations. The United Kingdom has launched an ambitious plan for bee conservation, “The National Pollinator Strategy”. This plan is based on five key areas: (i) supporting

pollinators on farmland; (ii) supporting pollinators in cities and the countryside; (iii) enhancing the response to pest and disease risks; (iv) raising awareness of what pollinators need; and (v) improving evidence on the status of pollinators and the services they provide. Moreover, some bee species also count on targeted and specific Biodiversity Action Plans in the UK. Other EU Member States are also developing bee initiatives and strategies (e.g., France).

National Red Lists or Red Data Books of bees have been developed in many European countries in order to provide special protection to bee species at the national level. These include the Red Lists of Belarus (Prischchepchik 2008), Czech Republic (Farkac *et al.* 2005), Denmark (Wind and Pihl 2010), Estonia (Lilleleht 2001), Finland (Rassi *et al.* 2010), Germany (Westrich *et al.* 2008, 2011), Great Britain (Shirt 1987), Hungary (Sárospataki *et al.* 2005), Ireland (Fitzpatrick *et al.* 2006), Latvia (Spuris 1998), Lithuania (Rašomavičius 2007), Moldova (Dectiu 2002), the Netherlands (Peeters and Reemer 2003), Norway (Kålås *et al.* 2010), Poland (Głowaciński and Nowacki 2009), Slovakia (Belakova 1996), Slovenia (Anonymous 2002), Spain (Verdú and Galante 2006, Verdú and Galante 2008, Verdú *et al.* 2011), Sweden (Gärdenfors 2010), Switzerland (Amiet 1994) and Ukraine (Radchenko *et al.* 2009); and some of these countries have actually assessed their species more than once (e.g., Germany and Sweden). There are other regional Red Lists such as the Red Book of invertebrates of Andalusia (Spain) (Barea *et al.* 2008), the Red List of Carpathian Endangered Species (Witkowski *et al.* 2003) or the Red List of the Tula Region (Bolshakov *et al.* 2013). Additionally, a few countries have legislation in place with the aim of legally protecting all or some species of bees,

such as Belgium, Germany, Czech Republic, Switzerland, Slovakia, Hungary or Poland.

4.4 Extinction risk versus conservation status

The IUCN Red List Criteria classifies species solely on the basis of their relative extinction risk (IUCN 2012a). However, Unfavourable Conservation Status according to the EU Habitats Directive has a much broader definition. This is identified clearly in Article 1 of the Directive (see Box 3). No species meeting the IUCN Red List Criteria for one of the threatened categories at a regional level can be considered to have a Favourable Conservation Status in the EU. To be classified as Vulnerable (the lowest of the three IUCN threatened categories) a species must undergo a reduction in population size of at least 30% over ten years or three generations (or have a very small or small and declining population or geographic range). It is difficult to claim that a species experiencing a decline of this magnitude is maintaining its population, that its range is stable, and that it remains a viable component of its habitat. Crucially, however, this does not mean that the opposite is true: species that are not threatened as defined by IUCN Red List Criteria do not necessarily have a Favourable Conservation Status (BirdLife International 2004). Guidelines issued by the European Commission on the protection of species under the Habitats Directive reinforce that ‘the fact that a habitat or species is not threatened (i.e. not faced by any direct extinction risk) does not necessarily mean that it has a favourable conservation status’.

Many bee species appear to remain widely distributed in Europe, although their populations and ranges have suffered significant long-term declines as a result of

Box 3: Selected provisions of the EU Habitats Directive (92/43/EEC)

Article 1(i) defines the conservation status of a species as “the sum of the influences acting on the species concerned that may affect the long-term distribution and abundance of its populations in the European territory of the Member States”. It states that a species’ conservation status will be taken as Favourable when:

- Population dynamics data on the species concerned suggests that it is maintaining itself on a long-term basis as a viable component of its natural habitats; and
- The natural range of the species is neither being reduced nor is likely to be reduced for the considerable future; and
- There is, and probably will continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

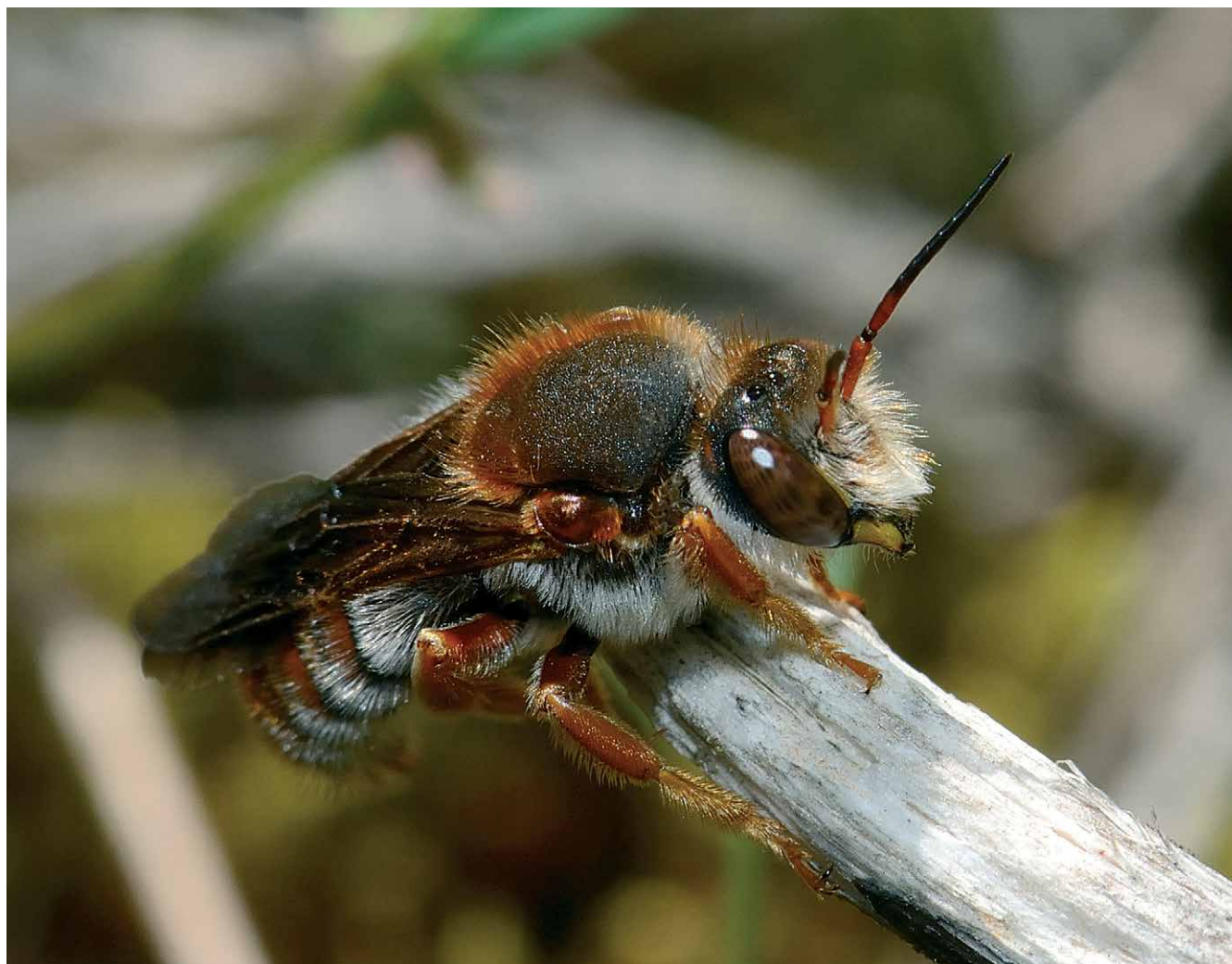
habitat loss and degradation in conjunction with other threats (see sections 3.4 and 3.5). The European Red List has highlighted the fact that 9.2% of bees have declining populations and almost 80% have unknown population trends (see Figure 12). Special emphasis needs to be placed on Data Deficient species, especially as some are suspected to be in a critical state of decline at the national level in some parts of the EU and within Europe, but the lack of information from across the whole range or part of the range of these species meant that a threat category could not be assigned. These species should not be regarded as having Favourable Conservation Status, and should be the focus of further research across the region.

4.5 Red List versus priority for conservation action

Assessment of extinction risk and setting conservation priorities are two related but different processes. Assessment of extinction risk, such as the assignment of IUCN Red List Categories, generally precedes the

setting of conservation priorities. The purpose of the Red List categorisation is to produce a relative estimate of the likelihood of extinction of a taxon. Setting conservation priorities, on the other hand, normally includes the assessment of extinction risk, but takes also into account other factors such as ecological, phylogenetic, historical, economical, or cultural preferences for some taxa over others, as well as the probability of success of conservation actions, availability of funds or personnel, cost-effectiveness, and legal frameworks for the conservation of threatened taxa. In the context of regional risk assessments, a number of additional pieces of information are valuable for setting conservation priorities. For example, it is important to consider not only conditions within the region but also the status of the taxon from a global perspective and the proportion of the global population that occurs within the region. The decision on how these three variables, as well as the other factors, are used for establishing conservation priorities is a matter for the regional authorities to determine.

Rhodanthidium sticticum (Data Deficient). © D. Genoud.



5. Recommendations

5.1 Policy recommendations

Across Europe, many governments, NGOs and other parties are showing increasing commitment to conserving wild pollinators and supporting the services they provide to both crops and wild flowers. While these initiatives are moving in the right direction, there remain a number of significant opportunities to better protect Europe's wild bee fauna. Below, a series of policy recommendations followed by a set of supporting activities, are proposed which, if implemented, together would greatly strengthen the long-term conservation of European pollinators. While many of these recommendations are focussed on wild bees, they are also likely to have benefits to managed honeybees, to wider biodiversity, and may also enhance the provision of pollination services, though the latter is not specifically the target of our recommendations.

5.1.1 Policy recommendations

1. Species conservation

- Identify opportunities under European and Member State Biodiversity Strategies to develop targeted species and habitat specific conservation measures for wild bees, and particularly those species of conservation concern.
- Develop systematic continental and national tools and resources to monitor the diversity and abundance of bees, including rare species as well as wider bee biodiversity. Ensure standardised methods are adopted to allow comparison across and within European countries.
- Build dedicated networks of bee experts to advise local and national authorities on effective conservation actions.
- Develop measures and legislation to reduce the potential for pest and disease transmission between managed and wild bees, particularly in areas where priority bee species are present. International trade in managed pollinators should be regulated, and the local breeding of managed pollinators for pollination services encouraged.

2. Habitat conservation

- Increase the protection of habitats supporting high bee diversity and endemism, and also those that act as source habitats for bees, with particular focus on Mediterranean and montane areas and species-rich grasslands.
- Develop new targets and indicators for priority bee habitats to assess and monitor the contribution of these to overall landscape quality for bees.
- Enhance cross-policy coordination to strengthen protection and restoration work for existing ecological networks (e.g., Natura 2000), including protected area sites, agri-environment measures and green infrastructure.
- Provide clear guidance to local and national planning authorities on how to implement Green Infrastructure in order to enhance the quality of the built landscape for wild bees, for example by creating areas of wildflowers on green spaces around new developments.

3. Agri-environment schemes

- Improve the effectiveness of Agri-Environment Schemes (AES) by setting specific long-term objectives, including those for wild bees, at a range of spatial scales and develop targeted options to support wider bee biodiversity in agro-ecosystems.
- Develop new AES measures which provide forage and, in particular, nesting resources for bees for a range of farming systems.
- Provide “bundles” of bee-friendly measures within AES, which can be deployed together to provide forage, nesting and other resources within local landscapes.
- Encourage industry-led efforts to support the uptake and effective management of AES options that benefit bees.

4. Agricultural production

- Realise opportunities under the Common Agricultural Policy (CAP) Pillar I to promote sustainable agriculture and improve the baseline quality of farmed land for bees by expanding the area required for Ecological Focus Areas (EFA) and encouraging novel land uses such as planting legumes and other cover crops.

- Encourage and support arable farmers to provide more diverse and abundant mass-flowering crops for bees within the farmed landscape.
- Develop additional support for alternative sustainable farming systems such as agroforestry and infield mixed cropping which can have substantial benefits to bees.
- Commit to a sustainable long-term reduction in the use of pesticides, with quantitative targets for the reductions in the total application of all pesticide active ingredients, and encourage the uptake of alternative pest management methods including the use of natural enemies and Integrated Pest Management (IPM).
- Improve the advice to farmers, landowners, managers of public and amenity spaces and gardeners on best practices for using insecticides. This should draw upon research evidence to provide guidance which takes in to account the diverse life histories of European bees and other pollinators.

5.1.2 Supporting activities

5. Knowledge and networks

- Support further research into the drivers of bee declines at a range of local and national scales and the identification of bees that act as indicators of localised ecosystem health.
- Invest in systematic research to fully characterise bee diversity across Europe.
- Expand the pool of bee experts and tools for bee identification, by facilitating European academic and government organisations to work together to strengthen the pool of taxonomic expertise and individuals able to identify species.
- Digitise national bee collections to make existing data widely available for analysis and to fill knowledge gaps.
- Establish a Europe-wide database of bee species with point data, linking the work of various NGOs and regional initiatives.

5.2 Application of project outputs

This European Red List of bees is part of a wider initiative aimed at assessing the status of European species. It provides key resources for decision-makers, policymakers, resources managers, environmental planners and NGOs. It has gathered large amounts of data on the population, ecology, habitats, threats and recommended conservation measures for each bee

species. These data are freely available on the IUCN Red List website (www.iucnredlist.org/initiatives/europe), on the European Commission's website (<http://ec.europa.eu/environment/nature/conservation/species/redlist>) and through paper publications (see the list of European Red Lists published at the end of this report).

This European Red List includes many species known to deliver pollination services to wildflowers and crops and thus contribute to livelihoods. It provides an interesting dimension by linking the status of these species to the state of key ecosystem services.

Red Lists are a dynamic tool that will evolve with time as species are re-assessed according to new information or situations. They are aimed at stimulating and supporting research, monitoring and conservation action at local, regional and international levels, especially for threatened, Near Threatened and Data Deficient species.

Each species assessment lists the major threats affecting the specific bee as well as conservation measures in place or needed. This will be useful to inform the application of conservation measures for each species.

The outputs of this project can be applied to inform policy, to identify priority sites for biodiversity and priority species to include in research and monitoring programmes.

5.3 Future work

Through the process of compiling data for the European Red List, a number of knowledge gaps have been identified. Across Europe there are significant geographic, geopolitical and taxonomic biases in the quality of data available on the distribution and status of species. Whilst some countries have their own national Red Lists for bees, accessing compiled bee data, especially on distributions and population trends, has proven to be difficult.

This project has mobilised a network of European and national bee experts, especially thanks to the contributions from the Status and Trends of European Pollinators (STEP) project (www.STEP-project.net), and has made extensive use of their knowledge and experience. It has benefitted greatly from the spatial data made available by the Atlas Hymenoptera (Rasmont and Haubruge 2014). However there are significant gaps in the geographical coverage of such open-source resources,

and issues to overcome, including taxonomic standards and data quality. There is a clear need for drawing together information from all data compilation initiatives under way or planned, and for a wider European bee conservation action plan to be explored, developed, and progressed.

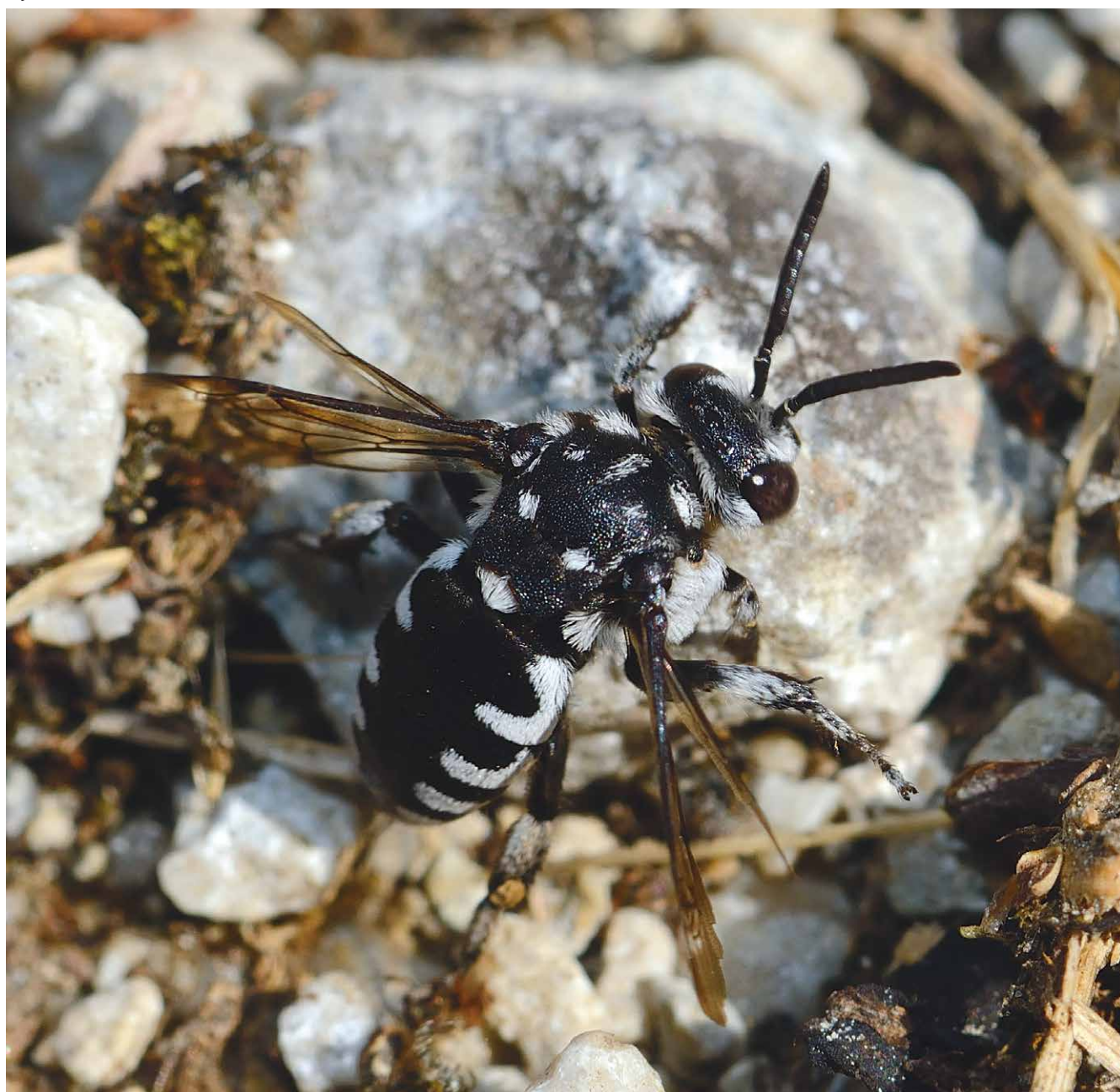
It is hoped that by presenting this assessment, national, regional and international research will be stimulated to provide new data and to improve on the quality of that already given.

Key challenges for the future are to improve monitoring and data quality, and to further develop data openness and dissemination so that the information and analyses

presented here can be updated and improved, and so conservation actions can be given as solid a scientific basis as possible.

If the bee assessments are periodically updated, they will enable the changing status of these species to be tracked through time via the production of a Red List Index (Butchart *et al.* 2004, 2005, 2006, 2007). To date, this indicator has been produced for birds, mammals, amphibians and reptiles at the European regional level and has been adopted as one of the headline biodiversity indicators to monitor progress towards halting biodiversity loss in Europe by 2020 (EEA 2007). By regularly updating the data presented here we will be able to track the changing fate of European bees to 2020 and beyond.

Thyreus ramosus (Least Concern). © D. Genoud.



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Appendix 1. Red List status of European bees

Taxonomy	IUCN Red List Category (Europe)	IUCN Red List Criteria (Europe)	IUCN Red List Category (EU 27)	IUCN Red List Criteria (EU 27)	Endemic to Europe	Endemic to EU 27
ANDRENIDAE						
<i>Andrena abbreviata</i>	DD		DD		No	No
<i>Andrena aberrans</i>	NT		NT		No	No
<i>Andrena abjecta</i>	DD		DD		No	No
<i>Andrena abrupta</i>	DD		DD		No	No
<i>Andrena aciculata</i>	DD		DD		No	No
<i>Andrena aegyptiaca</i>	NA		NA		No	No
<i>Andrena aeneiventris</i>	LC		LC		No	No
<i>Andrena aerinifrons</i>	DD		DD		No	No
<i>Andrena afrensis</i>	DD		DD		Yes	No
<i>Andrena agilissima</i>	DD		DD		No	No
<i>Andrena agnata</i>	DD		DD		No	No
<i>Andrena albopunctata</i>	LC		LC		No	No
<i>Andrena alfenella</i>	DD		DD		No	No
<i>Andrena alfenelloides</i>	DD		DD		No	No
<i>Andrena allosa</i>	DD		DD		No	No
<i>Andrena alluaudi</i>	LC		LC		No	No
<i>Andrena alutacea</i>	DD		DD		No	No
<i>Andrena anatolica</i>	LC		LC		No	No
<i>Andrena angustior</i>	DD		DD		No	No
<i>Andrena anthrisci</i>	LC		LC		Yes	No
<i>Andrena antigana</i>	LC		LC		No	No
<i>Andrena apicata</i>	DD		DD		No	No
<i>Andrena apiformis</i>	DD		DD		No	No
<i>Andrena argentata</i>	DD		DD		No	No
<i>Andrena asperrima</i>	LC		LC		No	No
<i>Andrena asperula</i>	DD		NE		No	No
<i>Andrena assimilis</i>	DD		DD		No	No
<i>Andrena astica</i>	LC		LC		No	No
<i>Andrena astrella</i>	DD		DD		Yes	Yes
<i>Andrena athenensis</i>	LC		LC		No	No
<i>Andrena atrata</i>	DD		DD		No	No
<i>Andrena atrotegularis</i>	DD		DD		No	No
<i>Andrena avara</i>	DD		DD		No	No
<i>Andrena barbareae</i>	DD		DD		Yes	No
<i>Andrena barbilabris</i>	DD		DD		No	No
<i>Andrena batava</i>	DD		DD		Yes	Yes
<i>Andrena bayona</i>	DD		DD		Yes	Yes
<i>Andrena bellidis</i>	DD		DD		No	No
<i>Andrena biarmica</i>	DD		DD		No	No
<i>Andrena bicolor</i>	LC		LC		No	No
<i>Andrena bicolorata</i>	LC		LC		No	No
<i>Andrena bimaculata</i>	DD		DD		No	No
<i>Andrena binominata</i>	LC		LC		No	No
<i>Andrena bisulcata</i>	LC		LC		No	No
<i>Andrena blanda</i>	DD		DD		No	No

Taxonomy	IUCN Red List Category (Europe)	IUCN Red List Criteria (Europe)	IUCN Red List Category (EU 27)	IUCN Red List Criteria (EU 27)	Endemic to Europe	Endemic to EU 27
<i>Andrena boyerella</i>	LC		LC		No	No
<i>Andrena braunsiana</i>	DD		DD		No	No
<i>Andrena breviscopa</i>	DD		DD		No	No
<i>Andrena brumanensis</i>	LC		LC		No	No
<i>Andrena bucephala</i>	DD		DD		Yes	No
<i>Andrena bulgariensis</i>	DD		DD		No	No
<i>Andrena canaeae</i>	LC		LC		No	No
<i>Andrena caneibia</i>	DD		DD		No	No
<i>Andrena canohirta</i>	DD		DD		No	No
<i>Andrena cantiacae</i>	DD		DD		No	No
<i>Andrena capillosa</i>	DD		NE		No	No
<i>Andrena caprimulga</i>	DD		NE		No	No
<i>Andrena carantonica</i>	DD		DD		No	No
<i>Andrena cervina</i>	DD		DD		Yes	Yes
<i>Andrena chaetogastra</i>	DD		DD		No	No
<i>Andrena chalcogastra</i>	DD		DD		Yes	Yes
<i>Andrena chelma</i>	DD		DD		Yes	Yes
<i>Andrena chersona</i>	DD		NE		No	No
<i>Andrena chrysopus</i>	DD		DD		No	No
<i>Andrena chrysopyga</i>	DD		DD		No	No
<i>Andrena chrysosceles</i>	DD		DD		No	No
<i>Andrena cineraria</i>	LC		LC		No	No
<i>Andrena cinerea</i>	DD		DD		No	No
<i>Andrena cinereophila</i>	LC		LC		No	No
<i>Andrena clarkella</i>	DD		DD		No	No
<i>Andrena clusia</i>	DD		DD		No	No
<i>Andrena clypella</i>	LC		LC		No	No
<i>Andrena coitana</i>	DD		DD		No	No
<i>Andrena colletiformis</i>	DD		DD		No	No
<i>Andrena colonialis</i>	DD		NE		No	No
<i>Andrena combaella</i>	DD		DD		No	No
<i>Andrena combinata</i>	DD		DD		No	No
<i>Andrena compta</i>	DD		DD		No	No
<i>Andrena comta</i>	EN	B2ab(iii,v)	EN	B2ab(iii,v)	No	No
<i>Andrena concinna</i>	LC		LC		Yes	No
<i>Andrena congruens</i>	LC		LC		No	No
<i>Andrena corax</i>	DD		DD		No	No
<i>Andrena cordialis</i>	DD		DD		No	No
<i>Andrena corssubalpina</i>	DD		DD		Yes	Yes
<i>Andrena crassana</i>	LC		LC		No	No
<i>Andrena creberrima</i>	DD		DD		No	No
<i>Andrena cubiceps</i>	DD		DD		No	No
<i>Andrena curiosa</i>	NA		NA		No	No
<i>Andrena curtula</i>	DD		DD		Yes	Yes
<i>Andrena curvana</i>	DD		DD		Yes	No
<i>Andrena curvungula</i>	DD		DD		No	No
<i>Andrena cussariensis</i>	NA		NE		No	No
<i>Andrena cyanomicans</i>	DD		DD		No	No
<i>Andrena cypria</i>	DD		DD		No	No
<i>Andrena cypricola</i>	DD		DD		Yes	Yes
<i>Andrena damara</i>	DD		DD		Yes	Yes
<i>Andrena danuvia</i>	DD		DD		No	No
<i>Andrena dargia</i>	DD		DD		No	No
<i>Andrena decipiens</i>	DD		DD		No	No
<i>Andrena delphiensis</i>	DD		DD		No	No
<i>Andrena denticulata</i>	DD		DD		No	No

Taxonomy	IUCN Red List Category (Europe)	IUCN Red List Criteria (Europe)	IUCN Red List Category (EU 27)	IUCN Red List Criteria (EU 27)	Endemic to Europe	Endemic to EU 27
<i>Andrena dentiventris</i>	NA		NE		No	No
<i>Andrena derbentina</i>	DD		DD		No	No
<i>Andrena dinizi</i>	DD		DD		Yes	Yes
<i>Andrena discors</i>	LC		LC		No	No
<i>Andrena distinguenda</i>	DD		DD		No	No
<i>Andrena djelfensis</i>	DD		DD		No	No
<i>Andrena dorsalis</i>	DD		DD		No	No
<i>Andrena dorsata</i>	DD		DD		No	No
<i>Andrena dourada</i>	DD		DD		Yes	Yes
<i>Andrena doursana</i>	DD		DD		No	No
<i>Andrena dubiosa</i>	DD		DD		No	No
<i>Andrena ebmerella</i>	DD		DD		Yes	Yes
<i>Andrena ehnbergi</i>	DD		NE		No	No
<i>Andrena elata</i>	DD		DD		Yes	Yes
<i>Andrena elegans</i>	DD		DD		No	No
<i>Andrena elmaria</i>	DD		DD		No	No
<i>Andrena enslinella</i>	DD		DD		No	No
<i>Andrena erberi</i>	DD		DD		No	No
<i>Andrena erythrocnemis</i>	DD		DD		No	No
<i>Andrena espanola</i>	DD		DD		Yes	Yes
<i>Andrena exigua</i>	DD		DD		No	No
<i>Andrena exquisita</i>	DD		DD		No	No
<i>Andrena fabrella</i>	DD		DD		No	No
<i>Andrena falsifica</i>	DD		DD		No	No
<i>Andrena farinosa</i>	DD		DD		Yes	Yes
<i>Andrena ferox</i>	DD		DD		No	No
<i>Andrena ferrugineicrus</i>	LC		LC		No	No
<i>Andrena fertoni</i>	DD		DD		No	No
<i>Andrena figurata</i>	DD		DD		No	No
<i>Andrena fimbriata</i>	DD		DD		Yes	No
<i>Andrena flavilabris</i>	DD		DD		No	No
<i>Andrena flavipes</i>	LC		LC		No	No
<i>Andrena flavobila</i>	DD		DD		No	No
<i>Andrena florea</i>	DD		DD		No	No
<i>Andrena florentina</i>	DD		DD		No	No
<i>Andrena floricola</i>	DD		DD		No	No
<i>Andrena florivaga</i>	LC		LC		No	No
<i>Andrena forsterella</i>	LC		LC		No	No
<i>Andrena freygessneri</i>	DD		DD		Yes	No
<i>Andrena fria</i>	DD		DD		Yes	Yes
<i>Andrena fucata</i>	DD		DD		No	No
<i>Andrena fuliginata</i>	NA		NA		No	No
<i>Andrena fulva</i>	DD		DD		Yes	No
<i>Andrena fulvago</i>	DD		DD		No	No
<i>Andrena fulvata</i>	DD		DD		Yes	No
<i>Andrena fulvicornis</i>	DD		DD		No	No
<i>Andrena fulvida</i>	NT		NT		No	No
<i>Andrena fulvitaris</i>	LC		LC		No	No
<i>Andrena fumida</i>	DD		DD		No	No
<i>Andrena funerea</i>	DD		DD		Yes	Yes
<i>Andrena fuscipes</i>	DD		DD		No	No
<i>Andrena fuscocalcarata</i>	DD		DD		No	No
<i>Andrena fuscosa</i>	DD		DD		No	No
<i>Andrena gallica</i>	NT		NT		No	No
<i>Andrena gamskrucki</i>	DD		DD		No	No
<i>Andrena gelriae</i>	DD		DD		No	No

Taxonomy	IUCN Red List Category (Europe)	IUCN Red List Criteria (Europe)	IUCN Red List Category (EU 27)	IUCN Red List Criteria (EU 27)	Endemic to Europe	Endemic to EU 27
<i>Andrena glandaria</i>	DD		DD		No	No
<i>Andrena glidia</i>	DD		DD		No	No
<i>Andrena gordia</i>	DD		DD		No	No
<i>Andrena graecella</i>	DD		DD		Yes	No
<i>Andrena grandilabris</i>	DD		DD		No	No
<i>Andrena granulosa</i>	LC		LC		No	No
<i>Andrena gravida</i>	DD		DD		No	No
<i>Andrena gredana</i>	DD		DD		Yes	Yes
<i>Andrena grossella</i>	DD		DD		Yes	Yes
<i>Andrena grozdanici</i>	DD		NE		No	No
<i>Andrena haemorrhhoa</i>	LC		LC		No	No
<i>Andrena hattorfiana</i>	NT		NT		No	No
<i>Andrena hedikae</i>	DD		DD		No	No
<i>Andrena heinrichi</i>	DD		DD		No	No
<i>Andrena helenica</i>	DD		DD		Yes	Yes
<i>Andrena helvola</i>	DD		DD		No	No
<i>Andrena hesperia</i>	LC		LC		No	No
<i>Andrena hillana</i>	DD		DD		Yes	Yes
<i>Andrena hispania</i>	LC		LC		No	No
<i>Andrena humabilis</i>	DD		DD		No	No
<i>Andrena humilis</i>	DD		DD		No	No
<i>Andrena hungarica</i>	DD		DD		No	No
<i>Andrena hyacinthina</i>	DD		DD		No	No
<i>Andrena hybrida</i>	DD		NE		No	No
<i>Andrena hyemala</i>	DD		DD		No	No
<i>Andrena hypopolia</i>	DD		DD		No	No
<i>Andrena hystrix</i>	DD		DD		No	No
<i>Andrena icterina</i>	DD		DD		No	No
<i>Andrena illyrica</i>	DD		DD		Yes	No
<i>Andrena impunctata</i>	LC		LC		No	No
<i>Andrena incisa</i>	DD		DD		No	No
<i>Andrena intermedia</i>	LC		LC		No	No
<i>Andrena isis</i>	NA		NA		No	No
<i>Andrena ispida</i>	DD		DD		No	No
<i>Andrena kamarti</i>	DD		DD		No	No
<i>Andrena korleviciana</i>	DD		DD		Yes	No
<i>Andrena kornosica</i>	DD		DD		Yes	Yes
<i>Andrena kriebbaumeri</i>	DD		DD		No	No
<i>Andrena labialis</i>	DD		DD		No	No
<i>Andrena labiata</i>	DD		DD		No	No
<i>Andrena labiatula</i>	CR	B1ab(iii)+2ab(iii)	CR	B1ab(iii)+2ab(iii)	Yes	No
<i>Andrena lagopus</i>	LC		LC		No	No
<i>Andrena lamiana</i>	LC		LC		No	No
<i>Andrena langadensis</i>	LC		LC		No	No
<i>Andrena lapponica</i>	LC		LC		No	No
<i>Andrena lateralis</i>	DD		DD		No	No
<i>Andrena lathyri</i>	DD		DD		No	No
<i>Andrena lepida</i>	DD		DD		No	No
<i>Andrena leptopyga</i>	DD		DD		No	No
<i>Andrena leucolippa</i>	LC		LC		Yes	Yes
<i>Andrena leucophaea</i>	DD		DD		No	No
<i>Andrena leucopsis</i>	DD		DD		No	No
<i>Andrena limassolica</i>	DD		DD		No	No
<i>Andrena limata</i>	DD		DD		No	No
<i>Andrena limbata</i>	DD		DD		No	No
<i>Andrena limonii</i>	DD		NE		No	No

Taxonomy	IUCN Red List Category (Europe)	IUCN Red List Criteria (Europe)	IUCN Red List Category (EU 27)	IUCN Red List Criteria (EU 27)	Endemic to Europe	Endemic to EU 27
<i>Andrena lindbergella</i>	DD		DD		No	No
<i>Andrena lineolata</i>	DD		DD		Yes	Yes
<i>Andrena livens</i>	LC		LC		No	No
<i>Andrena longibarbis</i>	DD		DD		No	No
<i>Andrena lonicera</i>	DD		DD		Yes	No
<i>Andrena macroptera</i>	DD		DD		No	No
<i>Andrena maderensis</i>	LC		LC		Yes	Yes
<i>Andrena magna</i>	EN	B2ab(iii)	EN	B2ab(iii)	No	No
<i>Andrena magunta</i>	DD		DD		No	No
<i>Andrena majalis</i>	NA		NA		No	No
<i>Andrena marginata</i>	DD		DD		No	No
<i>Andrena mariana</i>	DD		DD		No	No
<i>Andrena medeninensis</i>	DD		DD		No	No
<i>Andrena mediovittata</i>	DD		DD		No	No
<i>Andrena mehelyi</i>	DD		DD		No	No
<i>Andrena merula</i>	DD		DD		No	No
<i>Andrena metallescens</i>	NA		NE		No	No
<i>Andrena microthorax</i>	DD		DD		No	No
<i>Andrena miegiella</i>	LC		LC		No	No
<i>Andrena minapalumboi</i>	DD		DD		No	No
<i>Andrena minutula</i>	DD		DD		No	No
<i>Andrena minutuloides</i>	DD		DD		No	No
<i>Andrena mistrensis</i>	DD		DD		No	No
<i>Andrena mitis</i>	DD		DD		No	No
<i>Andrena mocsaryi</i>	LC		LC		No	No
<i>Andrena monacha</i>	DD		DD		No	No
<i>Andrena monilia</i>	DD		DD		No	No
<i>Andrena montana</i>	DD		DD		Yes	No
<i>Andrena montarca</i>	DD		DD		Yes	Yes
<i>Andrena morio</i>	DD		DD		No	No
<i>Andrena mucida</i>	DD		DD		No	No
<i>Andrena mucronata</i>	LC		LC		No	No
<i>Andrena murana</i>	DD		DD		Yes	Yes
<i>Andrena muscaria</i>	DD		DD		Yes	Yes
<i>Andrena nana</i>	LC		LC		No	No
<i>Andrena nanaeformis</i>	LC		VU	B2ab(v)	No	No
<i>Andrena nanula</i>	DD		DD		No	No
<i>Andrena nasuta</i>	DD		DD		No	No
<i>Andrena nebularia</i>	DD		DD		Yes	Yes
<i>Andrena neocyprica</i>	LC		LC		No	No
<i>Andrena neovirida</i>	DD		DD		Yes	Yes
<i>Andrena nigriceps</i>	DD		DD		No	No
<i>Andrena nigroaenea</i>	LC		LC		No	No
<i>Andrena nigroolivacea</i>	LC		LC		No	No
<i>Andrena nigroviridula</i>	DD		DD		No	No
<i>Andrena nilotica</i>	DD		DD		Yes	Yes
<i>Andrena nisoria</i>	NA		NA		No	No
<i>Andrena nitida</i>	LC		LC		No	No
<i>Andrena nitidiuscula</i>	LC		LC		No	No
<i>Andrena nitidula</i>	DD		DD		Yes	Yes
<i>Andrena niveata</i>	DD		DD		No	No
<i>Andrena nobilis</i>	DD		DD		No	No
<i>Andrena notata</i>	DD		DD		Yes	Yes
<i>Andrena nucleola</i>	DD		DD		No	No
<i>Andrena numida</i>	DD		DD		No	No
<i>Andrena nuptialis</i>	LC		LC		Yes	No

Taxonomy	IUCN Red List Category (Europe)	IUCN Red List Criteria (Europe)	IUCN Red List Category (EU 27)	IUCN Red List Criteria (EU 27)	Endemic to Europe	Endemic to EU 27
<i>Andrena nycthemera</i>	DD		DD		No	No
<i>Andrena olympica</i>	DD		DD		Yes	Yes
<i>Andrena optata</i>	DD		DD		No	No
<i>Andrena oralis</i>	DD		DD		No	No
<i>Andrena orana</i>	DD		DD		No	No
<i>Andrena orbitalis</i>	LC		LC		No	No
<i>Andrena orientana</i>	LC		LC		No	No
<i>Andrena ornata</i>	CR	B2ab(iii)	NE		No	No
<i>Andrena osychniukae</i>	DD		DD		No	No
<i>Andrena oulskii</i>	DD		DD		No	No
<i>Andrena ovatula</i>	NT		NT		No	No
<i>Andrena oviventris</i>	DD		DD		No	No
<i>Andrena paganettina</i>	DD		DD		No	No
<i>Andrena pallidicincta</i>	DD		DD		No	No
<i>Andrena pallitarsis</i>	DD		DD		No	No
<i>Andrena palumba</i>	DD		DD		No	No
<i>Andrena pandellei</i>	LC		LC		No	No
<i>Andrena pandosa</i>	DD		DD		No	No
<i>Andrena panurgimorpha</i>	LC		LC		No	No
<i>Andrena panurgina</i>	LC		LC		No	No
<i>Andrena paramythensis</i>	DD		DD		No	No
<i>Andrena pareklisiae</i>	DD		DD		Yes	Yes
<i>Andrena parviceps</i>	LC		LC		No	No
<i>Andrena passerina</i>	DD		DD		No	No
<i>Andrena pastellensis</i>	DD		DD		Yes	No
<i>Andrena paucisquama</i>	DD		DD		No	No
<i>Andrena pauxilla</i>	DD		DD		Yes	No
<i>Andrena pellucens</i>	DD		DD		Yes	Yes
<i>Andrena pelopa</i>	DD		DD		Yes	No
<i>Andrena phoenicura</i>	DD		DD		No	No
<i>Andrena pilipes</i>	LC		LC		No	No
<i>Andrena polemediانا</i>	DD		DD		No	No
<i>Andrena polita</i>	LC		LC		No	No
<i>Andrena pontica</i>	DD		DD		No	No
<i>Andrena potentillae</i>	DD		DD		No	No
<i>Andrena praecox</i>	LC		LC		No	No
<i>Andrena probata</i>	DD		DD		No	No
<i>Andrena producta</i>	DD		DD		No	No
<i>Andrena propinqua</i>	DD		DD		No	No
<i>Andrena proxima</i>	DD		DD		No	No
<i>Andrena pruinosa</i>	DD		DD		No	No
<i>Andrena pusilla</i>	DD		DD		No	No
<i>Andrena pyropygia</i>	LC		LC		No	No
<i>Andrena pyrozonata</i>	DD		DD		No	No
<i>Andrena quadrimaculata</i>	DD		DD		No	No
<i>Andrena ranunculi</i>	LC		LC		No	No
<i>Andrena ranunculorum</i>	DD		DD		No	No
<i>Andrena relata</i>	DD		DD		Yes	Yes
<i>Andrena reperta</i>	DD		DD		No	No
<i>Andrena resoluta</i>	DD		DD		Yes	No
<i>Andrena rhenana</i>	DD		DD		Yes	No
<i>Andrena rhypara</i>	DD		DD		No	No
<i>Andrena rhyssonota</i>	LC		LC		No	No
<i>Andrena robusta</i>	DD		DD		No	No
<i>Andrena rogenhoferi</i>	LC		LC		Yes	No
<i>Andrena roripae</i>	DD		NE		No	No

Taxonomy	IUCN Red List Category (Europe)	IUCN Red List Criteria (Europe)	IUCN Red List Category (EU 27)	IUCN Red List Criteria (EU 27)	Endemic to Europe	Endemic to EU 27
<i>Andrena rosae</i>	DD		DD		No	No
<i>Andrena roseipes</i>	DD		DD		Yes	No
<i>Andrena rotundata</i>	DD		DD		No	No
<i>Andrena rudolfae</i>	DD		NE		No	No
<i>Andrena ruficrus</i>	LC		LC		No	No
<i>Andrena rufizona</i>	DD		DD		No	No
<i>Andrena rufula</i>	LC		LC		No	No
<i>Andrena rugothorace</i>	LC		LC		No	No
<i>Andrena rugulosa</i>	DD		DD		No	No
<i>Andrena rugulosella</i>	DD		NE		No	No
<i>Andrena russula</i>	DD		DD		No	No
<i>Andrena saettana</i>	DD		DD		No	No
<i>Andrena sagittaria</i>	DD		DD		Yes	Yes
<i>Andrena sandanskia</i>	DD		DD		Yes	Yes
<i>Andrena sarloa</i>	LC		LC		No	No
<i>Andrena savignyi</i>	DD		DD		No	No
<i>Andrena saxonica</i>	DD		DD		No	No
<i>Andrena schencki</i>	DD		DD		No	No
<i>Andrena schlettereri</i>	DD		DD		No	No
<i>Andrena schmiedeknechti</i>	LC		LC		No	No
<i>Andrena schulzi</i>	LC		LC		No	No
<i>Andrena schwarzi</i>	DD		NE		No	No
<i>Andrena scita</i>	DD		DD		No	No
<i>Andrena semilaevis</i>	DD		DD		Yes	No
<i>Andrena seminuda</i>	DD		DD		No	No
<i>Andrena semirubra</i>	DD		NE		No	No
<i>Andrena senecionis</i>	LC		LC		No	No
<i>Andrena sericata</i>	DD		DD		No	No
<i>Andrena sernaticornis</i>	DD		DD		No	No
<i>Andrena sibthorpi</i>	DD		DD		Yes	Yes
<i>Andrena siciliana</i>	DD		DD		Yes	Yes
<i>Andrena sillata</i>	LC		LC		No	No
<i>Andrena similis</i>	DD		DD		No	No
<i>Andrena simillima</i>	LC		LC		No	No
<i>Andrena simontomyella</i>	LC		LC		No	No
<i>Andrena solenopalpa</i>	DD		DD		Yes	Yes
<i>Andrena soror</i>	DD		DD		No	No
<i>Andrena sphaecodimorpha</i>	DD		DD		No	No
<i>Andrena spolata</i>	DD		DD		No	No
<i>Andrena spreta</i>	DD		DD		No	No
<i>Andrena stabiana</i>	LC		LC		No	No
<i>Andrena standfussorum</i>	DD		DD		Yes	Yes
<i>Andrena stepposa</i>	EN	B2ab(iii,v)	EN	B2ab(iii,v)	Yes	No
<i>Andrena stigmatica</i>	EN	B1ab(i,ii,iii)+2ab(i,ii,iii)	NE		No	No
<i>Andrena stoeckbertella</i>	DD		NE		No	No
<i>Andrena strohmella</i>	LC		LC		Yes	No
<i>Andrena subopaca</i>	LC		LC		No	No
<i>Andrena suerinensis</i>	DD		DD		Yes	No
<i>Andrena susterai</i>	DD		DD		No	No
<i>Andrena symphyti</i>	DD		DD		No	No
<i>Andrena synadelpha</i>	DD		DD		No	No
<i>Andrena taprobana</i>	DD		DD		No	No
<i>Andrena taraxaci</i>	DD		DD		No	No
<i>Andrena tarsata</i>	DD		DD		No	No
<i>Andrena taxana</i>	DD		DD		Yes	Yes
<i>Andrena tenuiformis</i>	DD		DD		No	No

Taxonomy	IUCN Red List Category (Europe)	IUCN Red List Criteria (Europe)	IUCN Red List Category (EU 27)	IUCN Red List Criteria (EU 27)	Endemic to Europe	Endemic to EU 27
<i>Andrena tenuistriata</i>	LC		LC		No	No
<i>Andrena thomsonii</i>	DD		DD		No	No
<i>Andrena thoracica</i>	DD		DD		No	No
<i>Andrena tiiaretta</i>	DD		DD		No	No
<i>Andrena tibialis</i>	LC		LC		No	No
<i>Andrena toelgiana</i>	DD		DD		No	No
<i>Andrena tomora</i>	DD		DD		No	No
<i>Andrena torda</i>	DD		DD		No	No
<i>Andrena transitoria</i>	VU	A2c	VU	A2c	No	No
<i>Andrena tricuspidata</i>	DD		DD		Yes	No
<i>Andrena tridentata</i>	CR	B2ab(v)	CR	B2ab(v)	No	No
<i>Andrena trikalensis</i>	DD		DD		Yes	Yes
<i>Andrena trimmerana</i>	DD		DD		No	No
<i>Andrena tringa</i>	LC		LC		No	No
<i>Andrena troodica</i>	DD		DD		No	No
<i>Andrena truncatilabris</i>	DD		DD		No	No
<i>Andrena tscheki</i>	DD		DD		No	No
<i>Andrena tuberculifera</i>	NA		NA		No	No
<i>Andrena tunetana</i>	LC		LC		No	No
<i>Andrena ungeri</i>	LC		LC		No	No
<i>Andrena urdula</i>	LC		LC		No	No
<i>Andrena vacella</i>	DD		DD		Yes	Yes
<i>Andrena vachali</i>	LC		LC		No	No
<i>Andrena vaga</i>	LC		LC		No	No
<i>Andrena variabilis</i>	DD		DD		No	No
<i>Andrena varians</i>	LC		LC		No	No
<i>Andrena vaulogeri</i>	DD		DD		No	No
<i>Andrena ventralis</i>	DD		DD		No	No
<i>Andrena ventricosa</i>	DD		DD		No	No
<i>Andrena verae</i>	DD		NE		No	No
<i>Andrena verticalis</i>	LC		LC		No	No
<i>Andrena vetula</i>	LC		LC		No	No
<i>Andrena villipes</i>	LC		LC		No	No
<i>Andrena viridescens</i>	DD		DD		No	No
<i>Andrena volgensis</i>	DD		NE		No	No
<i>Andrena vulcana</i>	NT		NT		No	No
<i>Andrena vulpecula</i>	DD		DD		No	No
<i>Andrena westensis</i>	LC		LC		No	No
<i>Andrena wilhelmi</i>	DD		DD		No	No
<i>Andrena wilkella</i>	DD		DD		No	No
<i>Andrena wolffi</i>	DD		DD		No	No
<i>Andrena wollastoni</i>	LC		LC		Yes	Yes
<i>Camptopoeum friesei</i>	LC		LC		No	No
<i>Camptopoeum frontale</i>	DD		DD		No	No
<i>Camptopoeum nasutum</i>	DD		DD		Yes	Yes
<i>Camptopoeum variegatum</i>	DD		DD		No	No
<i>Clavipanurgus sculpturatus</i>	DD		DD		No	No
<i>Flavipanurgus flavus</i>	LC		LC		Yes	Yes
<i>Flavipanurgus fuzetus</i>	DD		DD		Yes	Yes
<i>Flavipanurgus granadensis</i>	EN	B2ab(iii)	EN	B2ab(iii)	Yes	Yes
<i>Flavipanurgus ibericus</i>	LC		LC		Yes	Yes
<i>Flavipanurgus merceti</i>	DD		DD		Yes	Yes
<i>Flavipanurgus venustus</i>	LC		LC		Yes	Yes
<i>Melitturga caudata</i>	LC		LC		No	No
<i>Melitturga clavicornis</i>	NT		NT		No	No
<i>Melitturga praestans</i>	DD		DD		No	No

Taxonomy	IUCN Red List Category (EUPE)	IUCN Red List Criteria (Europe)	IUCN Red List Category (EU 27)	IUCN Red List Criteria (EU 27)	Endemic to Europe	Endemic to EU 27
<i>Melitturga spinosa</i>	DD		DD		No	No
<i>Melitturga syriaca</i>	DD		DD		No	No
<i>Melitturga taurica</i>	DD		DD		No	No
<i>Panurginus albopilosus</i>	LC		LC		No	No
<i>Panurginus alpinus</i>	DD		DD		Yes	No
<i>Panurginus annulatus</i>	DD		DD		Yes	Yes
<i>Panurginus brullei</i>	DD		DD		No	No
<i>Panurginus herzi</i>	DD		DD		No	No
<i>Panurginus labiatus</i>	DD		DD		No	No
<i>Panurginus lactipennis</i>	DD		DD		No	No
<i>Panurginus montanus</i>	DD		DD		Yes	No
<i>Panurginus romani</i>	DD		DD		No	No
<i>Panurginus schwarzi</i>	DD		DD		Yes	Yes
<i>Panurginus sericatus</i>	DD		DD		Yes	No
<i>Panurginus tyrolensis</i>	DD		DD		Yes	No
<i>Panurgus banksianus</i>	LC		LC		No	No
<i>Panurgus calcaratus</i>	LC		LC		No	No
<i>Panurgus canarius</i>	LC		LC		No	No
<i>Panurgus canescens</i>	LC		LC		Yes	Yes
<i>Panurgus cephalotes</i>	LC		LC		No	No
<i>Panurgus corsicus</i>	DD		DD		Yes	Yes
<i>Panurgus dargius</i>	DD		DD		No	No
<i>Panurgus dentipes</i>	LC		LC		Yes	No
<i>Panurgus meridionalis</i>	LC		LC		Yes	Yes
<i>Panurgus perezi</i>	LC		LC		No	No
<i>Panurgus pici</i>	DD		DD		No	No
<i>Panurgus siculus</i>	DD		DD		Yes	Yes
<i>Simpanurgus phyllopodus</i>	DD		DD		Yes	Yes
APIDAE						
<i>Amegilla albigena</i>	LC		LC		No	No
<i>Amegilla andresi</i>	DD		DD		No	No
<i>Amegilla canifrons</i>	LC		LC		Yes	Yes
<i>Amegilla fasciata</i>	DD		DD		No	No
<i>Amegilla garrula</i>	LC		LC		No	No
<i>Amegilla magnilabris</i>	DD		DD		No	No
<i>Amegilla nigricornis</i>	DD		NE		No	No
<i>Amegilla ochroleuca</i>	DD		DD		No	No
<i>Amegilla quadrifasciata</i>	LC		LC		No	No
<i>Amegilla salviae</i>	DD		DD		No	No
<i>Amegilla velocissima</i>	DD		DD		No	No
<i>Ammobates armeniacus</i>	NT		NT		No	No
<i>Ammobates dusmeti</i>	CR	B2ab(v)	CR	B2ab(v)	Yes	Yes
<i>Ammobates globosus</i>	DD		DD		No	No
<i>Ammobates mavromoustakisi</i>	DD		DD		No	No
<i>Ammobates melectoides</i>	EN	B2ab(i,ii,v)	EN	B2ab(i,ii,v)	Yes	No
<i>Ammobates muticus</i>	LC		LC		No	No
<i>Ammobates opacus</i>	DD		DD		No	No
<i>Ammobates oraniensis</i>	DD		DD		No	No
<i>Ammobates punctatus</i>	LC		LC		No	No
<i>Ammobates rufiventris</i>	DD		DD		No	No
<i>Ammobates sanguineus</i>	DD		DD		No	No
<i>Ammobates similis</i>	DD		DD		No	No
<i>Ammobates verhoeffi</i>	DD		DD		No	No
<i>Ammobates vinctus</i>	LC		LC		No	No
<i>Ammobatoides abdominalis</i>	EN	B2ab(i,v)	EN	B2ab(i,v)	No	No

Taxonomy	IUCN Red List Category (Europe)	IUCN Red List Criteria (Europe)	IUCN Red List Category (EU 27)	IUCN Red List Criteria (EU 27)	Endemic to Europe	Endemic to EU 27
<i>Ammobatooides luctuosus</i>	DD		DD		No	No
<i>Ammobatooides okalii</i>	DD		DD		Yes	Yes
<i>Ammobatooides scriptus</i>	DD		DD		No	No
<i>Ancyla asiatica</i>	DD		DD		No	No
<i>Ancyla cretensis</i>	DD		DD		No	No
<i>Ancyla holtzi</i>	DD		DD		No	No
<i>Ancyla nigricornis</i>	DD		DD		No	No
<i>Ancyla nitida</i>	DD		DD		No	No
<i>Ancyla oraniensis</i>	DD		DD		No	No
<i>Ancyla orientalis</i>	DD		DD		No	No
<i>Anthophora aestivalis</i>	LC		LC		No	No
<i>Anthophora affinis</i>	DD		DD		No	No
<i>Anthophora agama</i>	DD		DD		No	No
<i>Anthophora albosignata</i>	DD		DD		No	No
<i>Anthophora alluaudi</i>	LC		LC		Yes	Yes
<i>Anthophora altaica</i>	DD		NE		No	No
<i>Anthophora andalusica</i>	DD		DD		Yes	Yes
<i>Anthophora atriceps</i>	DD		DD		No	No
<i>Anthophora atricilla</i>	DD		NE		No	No
<i>Anthophora atroalba</i>	DD		DD		No	No
<i>Anthophora balearica</i>	DD		DD		Yes	Yes
<i>Anthophora balneorum</i>	LC		LC		No	No
<i>Anthophora bimaculata</i>	LC		LC		No	No
<i>Anthophora borealis</i>	NT		NT		No	No
<i>Anthophora calcarata</i>	LC		LC		No	No
<i>Anthophora canescens</i>	DD		DD		No	No
<i>Anthophora cincreus</i>	DD		NE		No	No
<i>Anthophora crassipes</i>	DD		DD		No	No
<i>Anthophora dalmatica</i>	DD		DD		Yes	No
<i>Anthophora deserticola</i>	DD		NE		No	No
<i>Anthophora dispar</i>	LC		LC		No	No
<i>Anthophora dubia</i>	DD		NE		No	No
<i>Anthophora dufourii</i>	DD		DD		No	No
<i>Anthophora erschowi</i>	DD		DD		No	No
<i>Anthophora femorata</i>	DD		DD		No	No
<i>Anthophora ferruginea</i>	DD		DD		No	No
<i>Anthophora fulvipes</i>	DD		DD		No	No
<i>Anthophora fulvitaris</i>	DD		DD		No	No
<i>Anthophora fulvodimidata</i>	DD		DD		No	No
<i>Anthophora furcata</i>	LC		LC		No	No
<i>Anthophora gallica</i>	DD		DD		Yes	Yes
<i>Anthophora gracilipes</i>	DD		NE		No	No
<i>Anthophora harmalae</i>	DD		DD		No	No
<i>Anthophora hispanica</i>	DD		DD		No	No
<i>Anthophora ireos</i>	DD		NE		No	No
<i>Anthophora laevigata</i>	DD		DD		Yes	Yes
<i>Anthophora lanata</i>	DD		DD		No	No
<i>Anthophora lanzarotensis</i>	DD		DD		Yes	Yes
<i>Anthophora larvata</i>	DD		DD		No	No
<i>Anthophora leucophaea</i>	DD		DD		No	No
<i>Anthophora lieftincki</i>	DD		DD		Yes	Yes
<i>Anthophora monacha</i>	DD		NE		No	No
<i>Anthophora mucida</i>	DD		DD		No	No
<i>Anthophora nigriceps</i>	DD		DD		No	No
<i>Anthophora nigrovittata</i>	DD		DD		Yes	Yes
<i>Anthophora orientalis</i>	DD		DD		No	No

Taxonomy	IUCN Red List Category (Europe)	IUCN Red List Criteria (Europe)	IUCN Red List Category (EU 27)	IUCN Red List Criteria (EU 27)	Endemic to Europe	Endemic to EU 27
<i>Anthophora orotavae</i>	DD		DD		Yes	Yes
<i>Anthophora pedata</i>	DD		DD		No	No
<i>Anthophora plagiata</i>	LC		LC		No	No
<i>Anthophora plumipes</i>	LC		LC		No	No
<i>Anthophora podagra</i>	DD		DD		No	No
<i>Anthophora ponomarevae</i>	DD		NE		No	No
<i>Anthophora porphyrea</i>	DD		DD		Yes	Yes
<i>Anthophora pruinosa</i>	DD		DD		Yes	Yes
<i>Anthophora pubescens</i>	DD		DD		No	No
<i>Anthophora pulverosa</i>	DD		DD		Yes	Yes
<i>Anthophora punctilabris</i>	DD		DD		Yes	Yes
<i>Anthophora purpuraria</i>	DD		DD		Yes	Yes
<i>Anthophora quadricolor</i>	DD		DD		No	No
<i>Anthophora quadrimaculata</i>	DD		DD		No	No
<i>Anthophora retusa</i>	LC		LC		No	No
<i>Anthophora robusta</i>	DD		DD		No	No
<i>Anthophora rogenhoferi</i>	DD		DD		No	No
<i>Anthophora romandii</i>	DD		DD		No	No
<i>Anthophora rubricrus</i>	DD		DD		No	No
<i>Anthophora rutilans</i>	DD		DD		No	No
<i>Anthophora salviae</i>	DD		DD		No	No
<i>Anthophora senescens</i>	DD		DD		No	No
<i>Anthophora senicula</i>	DD		DD		Yes	Yes
<i>Anthophora senilis</i>	DD		NE		No	No
<i>Anthophora sichelii</i>	DD		DD		Yes	Yes
<i>Anthophora socia</i>	DD		DD		No	No
<i>Anthophora thomsoni</i>	DD		DD		Yes	Yes
<i>Anthophora unciolata</i>	DD		DD		Yes	Yes
<i>Anthophora ventrilabris</i>	DD		DD		No	No
<i>Anthophora vernalis</i>	DD		NE		No	No
<i>Apis mellifera</i>	DD		DD		No	No
<i>Biastes brevicornis</i>	LC		LC		No	No
<i>Biastes emarginatus</i>	LC		LC		No	No
<i>Biastes truncatus</i>	VU	B2ab(i,ii,v)	VU	B2ab(i,ii,v)	No	No
<i>Bombus alpinus</i>	VU	B2b(i,ii,iii,v)c(iv)	VU	B2b(i,ii,iii,v)c(iv)	Yes	No
<i>Bombus argillaceus</i>	LC		LC		No	No
<i>Bombus armeniacus</i>	EN	A3c	EN	A3c	No	No
<i>Bombus balteatus</i>	LC		LC		No	No
<i>Bombus barbutellus</i>	LC		LC		No	No
<i>Bombus bohemicus</i>	LC		LC		No	No
<i>Bombus brodmannicus</i>	EN	B2ab(iii)c(iv)	EN	B2ab(iii)c(iv)	No	No
<i>Bombus campestris</i>	LC		LC		No	No
<i>Bombus cingulatus</i>	LC		LC		No	No
<i>Bombus confusus</i>	VU	A2c+3c+4c	VU	A2c+3c+4c	No	No
<i>Bombus consobrinus</i>	LC		LC		No	No
<i>Bombus cryptarum</i>	LC		LC		No	No
<i>Bombus cullumanus</i>	CR	A2c	CR	A2c	No	No
<i>Bombus deuteronymus</i>	DD		DD		No	No
<i>Bombus distinguendus</i>	VU	A2c	VU	A2c	No	No
<i>Bombus flavidus</i>	LC		LC		No	No
<i>Bombus fragrans</i>	EN	A2c+3c+4c	EN	A2c+3c+4c	No	No
<i>Bombus gerstaeckeri</i>	VU	B2ab(iii)	VU	B2ab(iii)	No	No
<i>Bombus glacialis</i>	DD		NE		No	No
<i>Bombus haematurus</i>	LC		LC		No	No
<i>Bombus hortorum</i>	LC		LC		No	No
<i>Bombus humilis</i>	LC		LC		No	No

Taxonomy	IUCN Red List Category (Europe)	IUCN Red List Criteria (Europe)	IUCN Red List Category (EU 27)	IUCN Red List Criteria (EU 27)	Endemic to Europe	Endemic to EU 27
<i>Bombus hyperboreus</i>	VU	B2b(i,ii,v)c(iv)	VU	B2b(i,ii,v)c(iv)	No	No
<i>Bombus hypnorum</i>	LC		LC		No	No
<i>Bombus inexpectatus</i>	EN	B2ab(iii)	EN	B2ab(iii)	Yes	No
<i>Bombus jonellus</i>	LC		LC		No	No
<i>Bombus laesus</i>	NT		NT		No	No
<i>Bombus lapidarius</i>	LC		LC		No	No
<i>Bombus lapponicus</i>	LC		LC		Yes	No
<i>Bombus lucorum</i>	LC		LC		No	No
<i>Bombus magnus</i>	LC		LC		Yes	No
<i>Bombus mendax</i>	NT		NT		Yes	No
<i>Bombus mesomelas</i>	LC		LC		No	No
<i>Bombus mlokosievitzii</i>	DD		DD		No	No
<i>Bombus mocsaryi</i>	EN	A2a	EN	A2a	No	No
<i>Bombus modestus</i>	DD		NE		No	No
<i>Bombus monticola</i>	LC		LC		No	No
<i>Bombus mucidus</i>	NT		NT		Yes	No
<i>Bombus muscorum</i>	VU	A2c	VU	A2c	No	No
<i>Bombus niveatus</i>	LC		LC		No	No
<i>Bombus norvegicus</i>	LC		LC		No	No
<i>Bombus pascuorum</i>	LC		LC		No	No
<i>Bombus patagiatus</i>	DD		NE		No	No
<i>Bombus perezi</i>	LC		LC		Yes	Yes
<i>Bombus pereziellus</i>	LC		LC		Yes	Yes
<i>Bombus polaris</i>	VU	B2b(ii,iii,v)c(iv)	VU	B2b(ii,iii,v)c(iv)	No	No
<i>Bombus pomorum</i>	VU	A2c	VU	A2c	No	No
<i>Bombus pratorum</i>	LC		LC		No	No
<i>Bombus pyrenaicus</i>	LC		LC		Yes	Yes
<i>Bombus quadricolor</i>	LC		LC		No	No
<i>Bombus reinigiellus</i>	EN	B1ab(iii)+2ab(iii); D	EN	B1ab(iii)+2ab(iii); D	Yes	Yes
<i>Bombus ruderarius</i>	LC		LC		No	No
<i>Bombus ruderatus</i>	LC		LC		No	No
<i>Bombus rupestris</i>	LC		LC		No	No
<i>Bombus saltuarius</i>	DD		NE		No	No
<i>Bombus schrencki</i>	LC		LC		No	No
<i>Bombus semenoviellus</i>	LC		LC		No	No
<i>Bombus sichelii</i>	LC		LC		No	No
<i>Bombus soroensis</i>	LC		LC		No	No
<i>Bombus sporadicus</i>	LC		LC		No	No
<i>Bombus subterraneus</i>	LC		LC		No	No
<i>Bombus sylvarum</i>	LC		LC		No	No
<i>Bombus sylvestris</i>	LC		LC		No	No
<i>Bombus terrestris</i>	LC		LC		No	No
<i>Bombus vestalis</i>	LC		LC		No	No
<i>Bombus veteranus</i>	LC		LC		No	No
<i>Bombus wurflenii</i>	LC		LC		No	No
<i>Bombus zonatus</i>	EN	B2b(i,ii,iii,v)c(iv)	EN	B2b(i,ii,iii,v)c(iv)	No	No
<i>Ceratina acuta</i>	LC		LC		No	No
<i>Ceratina albosticta</i>	DD		DD		No	No
<i>Ceratina bispinosa</i>	LC		LC		No	No
<i>Ceratina callosa</i>	LC		LC		No	No
<i>Ceratina chalcites</i>	LC		LC		No	No
<i>Ceratina chalybea</i>	LC		LC		No	No
<i>Ceratina chrysomalla</i>	LC		LC		No	No
<i>Ceratina cucurbitina</i>	LC		LC		No	No
<i>Ceratina cyanea</i>	LC		LC		No	No
<i>Ceratina cypriaca</i>	DD		DD		Yes	Yes

Taxonomy	IUCN Red List Category (Europe)	IUCN Red List Criteria (Europe)	IUCN Red List Category (EU 27)	IUCN Red List Criteria (EU 27)	Endemic to Europe	Endemic to EU 27
<i>Ceratina dallatorreana</i>	LC		LC		No	No
<i>Ceratina dentiventris</i>	LC		LC		No	No
<i>Ceratina gravidula</i>	LC		LC		Yes	No
<i>Ceratina loewi</i>	DD		DD		No	No
<i>Ceratina mandibularis</i>	LC		LC		No	No
<i>Ceratina mocsaryi</i>	LC		LC		No	No
<i>Ceratina moricei</i>	LC		LC		No	No
<i>Ceratina nigroaenea</i>	LC		LC		No	No
<i>Ceratina nigrolabiata</i>	LC		LC		No	No
<i>Ceratina parvula</i>	LC		LC		No	No
<i>Ceratina sakagamii</i>	DD		DD		No	No
<i>Ceratina saundersi</i>	LC		LC		No	No
<i>Ceratina schwarzi</i>	LC		LC		No	No
<i>Ceratina tarsata</i>	DD		DD		No	No
<i>Ceratina teunissenii</i>	DD		DD		Yes	Yes
<i>Ceratina zandeni</i>	DD		DD		No	No
<i>Ceratina zwakhalsi</i>	DD		NE		No	No
<i>Chiasmognathus orientanus</i>	NT		NT		No	No
<i>Cubitalia morio</i>	DD		DD		No	No
<i>Cubitalia parvicornis</i>	DD		DD		No	No
<i>Epeoloides coecutiens</i>	LC		LC		No	No
<i>Epeolus alpinus</i>	LC		LC		Yes	Yes
<i>Epeolus aureovestitus</i>	DD		DD		No	No
<i>Epeolus compar</i>	DD		DD		Yes	Yes
<i>Epeolus cruciger</i>	NT		NT		Yes	No
<i>Epeolus fallax</i>	LC		LC		Yes	Yes
<i>Epeolus fasciatus</i>	DD		DD		Yes	No
<i>Epeolus flavociliatus</i>	DD		DD		Yes	Yes
<i>Epeolus intermedius</i>	DD		DD		Yes	Yes
<i>Epeolus julliani</i>	LC		LC		No	No
<i>Epeolus minutus</i>	DD		NE		No	No
<i>Epeolus productulus</i>	DD		DD		Yes	No
<i>Epeolus schummeli</i>	NT		NT		No	No
<i>Epeolus siculus</i>	DD		DD		Yes	Yes
<i>Epeolus sigillatus</i>	DD		DD		Yes	Yes
<i>Epeolus tarsalis</i>	NT		NT		No	No
<i>Epeolus transitorius</i>	DD		DD		Yes	No
<i>Epeolus variegatus</i>	LC		LC		No	No
<i>Eucera albofasciata</i>	DD		DD		No	No
<i>Eucera algira</i>	DD		DD		No	No
<i>Eucera alternans</i>	DD		DD		No	No
<i>Eucera barbiventris</i>	DD		DD		No	No
<i>Eucera bidentata</i>	DD		DD		No	No
<i>Eucera brachycera</i>	DD		DD		No	No
<i>Eucera caerulea</i>	DD		DD		No	No
<i>Eucera caspica</i>	LC		LC		No	No
<i>Eucera chrysopyga</i>	LC		LC		No	No
<i>Eucera cineraria</i>	LC		LC		No	No
<i>Eucera clypeata</i>	LC		LC		No	No
<i>Eucera codinai</i>	DD		DD		Yes	Yes
<i>Eucera collaris</i>	DD		DD		No	No
<i>Eucera commixta</i>	DD		DD		No	No
<i>Eucera curvitaris</i>	DD		DD		No	No
<i>Eucera cypria</i>	DD		DD		No	No
<i>Eucera dalmatica</i>	LC		LC		No	No
<i>Eucera decolorata</i>	DD		DD		No	No

Taxonomy	IUCN Red List Category (IUCN)	IUCN Red List Criteria (Europe)	IUCN Red List Category (EU 27)	IUCN Red List Criteria (EU 27)	Endemic to Europe	Endemic to EU 27
<i>Eucera digitata</i>	LC		LC		No	No
<i>Eucera dimidiata</i>	LC		LC		No	No
<i>Eucera distinguenda</i>	DD		DD		No	No
<i>Eucera ebmeri</i>	DD		DD		No	No
<i>Eucera elongatula</i>	DD		DD		No	No
<i>Eucera eucnemidea</i>	LC		LC		No	No
<i>Eucera excisa</i>	DD		DD		No	No
<i>Eucera fasciata</i>	DD		DD		No	No
<i>Eucera fedtschenkoi</i>	DD		NE		No	No
<i>Eucera furfurea</i>	DD		DD		No	No
<i>Eucera gaullei</i>	LC		LC		No	No
<i>Eucera gracilipes</i>	NT		NT		Yes	Yes
<i>Eucera helvola</i>	DD		DD		No	No
<i>Eucera hispaliensis</i>	DD		DD		No	No
<i>Eucera hispana</i>	DD		DD		No	No
<i>Eucera hungarica</i>	LC		LC		No	No
<i>Eucera interrupta</i>	LC		LC		No	No
<i>Eucera kullenbergi</i>	DD		DD		No	No
<i>Eucera lanuginosa</i>	DD		DD		No	No
<i>Eucera laxiscopa</i>	DD		DD		No	No
<i>Eucera longicornis</i>	LC		LC		No	No
<i>Eucera lucasi</i>	DD		DD		No	No
<i>Eucera maroccana</i>	DD		DD		No	No
<i>Eucera mastrucata</i>	DD		NE		No	No
<i>Eucera maxima</i>	DD		DD		No	No
<i>Eucera mediterranea</i>	DD		DD		No	No
<i>Eucera microsoma</i>	LC		LC		No	No
<i>Eucera nigrescens</i>	LC		LC		No	No
<i>Eucera nigrifacies</i>	LC		LC		No	No
<i>Eucera nigrilabris</i>	DD		DD		No	No
<i>Eucera nigripes</i>	DD		DD		No	No
<i>Eucera notata</i>	DD		DD		No	No
<i>Eucera numida</i>	LC		LC		No	No
<i>Eucera obliterata</i>	DD		DD		No	No
<i>Eucera obsoleta</i>	DD		DD		No	No
<i>Eucera oraniensis</i>	DD		DD		No	No
<i>Eucera palestinae</i>	DD		DD		No	No
<i>Eucera pannonica</i>	DD		DD		No	No
<i>Eucera paraclypeata</i>	DD		DD		No	No
<i>Eucera parnassia</i>	LC		LC		No	No
<i>Eucera penicillata</i>	DD		DD		No	No
<i>Eucera plumigera</i>	DD		DD		No	No
<i>Eucera pollinaris</i>	DD		DD		No	No
<i>Eucera proxima</i>	DD		DD		No	No
<i>Eucera pseudeucnemidea</i>	DD		DD		No	No
<i>Eucera puncticollis</i>	DD		DD		No	No
<i>Eucera punctulata</i>	DD		DD		No	No
<i>Eucera pythagoras</i>	DD		DD		No	No
<i>Eucera quilisi</i>	DD		DD		Yes	Yes
<i>Eucera radoszkovskii</i>	DD		NE		No	No
<i>Eucera rufa</i>	DD		DD		No	No
<i>Eucera rufipes</i>	DD		NE		No	No
<i>Eucera seminuda</i>	LC		LC		No	No
<i>Eucera spectabilis</i>	DD		DD		No	No
<i>Eucera squamosa</i>	DD		DD		No	No
<i>Eucera syriaca</i>	DD		DD		No	No

Taxonomy	IUCN Red List Category (Europe)	IUCN Red List Criteria (Europe)	IUCN Red List Category (EU 27)	IUCN Red List Criteria (EU 27)	Endemic to Europe	Endemic to EU 27
<i>Eucera taurica</i>	DD		DD		No	No
<i>Eucera transitoria</i>	DD		NE		No	No
<i>Eucera tricincta</i>	LC		LC		No	No
<i>Eucera velutina</i>	DD		DD		No	No
<i>Eucera vernalis</i>	DD		NE		No	No
<i>Eucera vittulata</i>	DD		DD		No	No
<i>Eucera vulpes</i>	DD		DD		No	No
<i>Eucera zeta</i>	DD		DD		No	No
<i>Habropoda ezonata</i>	DD		DD		Yes	No
<i>Habropoda tarsata</i>	LC		LC		No	No
<i>Habropoda zonatula</i>	DD		DD		No	No
<i>Melecta aegyptiaca</i>	DD		DD		No	No
<i>Melecta albifrons</i>	LC		LC		No	No
<i>Melecta baeri</i>	DD		DD		No	No
<i>Melecta canariensis</i>	DD		DD		Yes	Yes
<i>Melecta caroli</i>	DD		DD		Yes	Yes
<i>Melecta curvispina</i>	DD		DD		Yes	Yes
<i>Melecta duodecimmaculata</i>	DD		DD		No	No
<i>Melecta festiva</i>	DD		DD		No	No
<i>Melecta fulgida</i>	DD		DD		No	No
<i>Melecta fumeraria</i>	DD		DD		No	No
<i>Melecta gracilipes</i>	DD		DD		Yes	Yes
<i>Melecta grandis</i>	DD		DD		No	No
<i>Melecta guichardi</i>	DD		DD		No	No
<i>Melecta guilochei</i>	DD		DD		No	No
<i>Melecta italica</i>	DD		DD		No	No
<i>Melecta leucorhyncha</i>	DD		DD		No	No
<i>Melecta luctuosa</i>	LC		LC		No	No
<i>Melecta mundula</i>	DD		DD		No	No
<i>Melecta obscura</i>	DD		DD		No	No
<i>Melecta prophanta</i>	DD		DD		No	No
<i>Melecta tuberculata</i>	DD		DD		No	No
<i>Nomada accentifera</i>	DD		DD		No	No
<i>Nomada agrestis</i>	LC		LC		No	No
<i>Nomada alboguttata</i>	LC		LC		No	No
<i>Nomada alpigena</i>	DD		DD		Yes	Yes
<i>Nomada argentata</i>	NT		NT		Yes	No
<i>Nomada argentea</i>	DD		DD		No	No
<i>Nomada ariasi</i>	DD		DD		Yes	Yes
<i>Nomada armata</i>	NT		NT		Yes	No
<i>Nomada arrogans</i>	DD		DD		Yes	No
<i>Nomada atroscutellaris</i>	LC		LC		Yes	No
<i>Nomada babiyi</i>	DD		DD		No	No
<i>Nomada baccata</i>	NT		NT		Yes	No
<i>Nomada barcelonensis</i>	DD		DD		Yes	Yes
<i>Nomada basalis</i>	LC		LC		No	No
<i>Nomada beaumonti</i>	LC		LC		No	No
<i>Nomada bifasciata</i>	LC		LC		No	No
<i>Nomada bispinosa</i>	LC		LC		No	No
<i>Nomada blepharipes</i>	DD		DD		No	No
<i>Nomada bluethgeni</i>	LC		LC		Yes	No
<i>Nomada bolivari</i>	DD		DD		Yes	Yes
<i>Nomada bouceki</i>	DD		DD		No	No
<i>Nomada braunsiana</i>	NT		NT		No	No
<i>Nomada cadiza</i>	DD		DD		No	No
<i>Nomada calimorpha</i>	DD		DD		No	No

Taxonomy	IUCN Red List Category (Europe)	IUCN Red List Criteria (Europe)	IUCN Red List Category (EU 27)	IUCN Red List Criteria (EU 27)	Endemic to Europe	Endemic to EU 27
<i>Nomada carnifex</i>	LC		LC		No	No
<i>Nomada caspia</i>	LC		LC		No	No
<i>Nomada castellana</i>	LC		LC		No	No
<i>Nomada cherkesiana</i>	DD		DD		No	No
<i>Nomada concolor</i>	LC		LC		Yes	No
<i>Nomada confinis</i>	DD		DD		No	No
<i>Nomada conjungens</i>	LC		LC		No	No
<i>Nomada connectens</i>	LC		LC		No	No
<i>Nomada corcyraea</i>	DD		DD		Yes	No
<i>Nomada coronata</i>	LC		LC		Yes	Yes
<i>Nomada coxalis</i>	DD		DD		No	No
<i>Nomada cretensis</i>	NT		NT		Yes	Yes
<i>Nomada cristata</i>	DD		DD		No	No
<i>Nomada cruenta</i>	LC		LC		No	No
<i>Nomada cypriaca</i>	DD		DD		No	No
<i>Nomada cypricola</i>	DD		DD		Yes	Yes
<i>Nomada diacantha</i>	DD		DD		No	No
<i>Nomada dira</i>	LC		LC		No	No
<i>Nomada discedens</i>	LC		LC		Yes	Yes
<i>Nomada discrepans</i>	LC		LC		No	No
<i>Nomada distinguenda</i>	LC		LC		No	No
<i>Nomada dolosa</i>	DD		DD		No	No
<i>Nomada duplex</i>	DD		DD		No	No
<i>Nomada emarginata</i>	LC		LC		No	No
<i>Nomada eos</i>	LC		LC		No	No
<i>Nomada errans</i>	NT		NT		Yes	No
<i>Nomada erythrocephala</i>	DD		DD		No	No
<i>Nomada fabriciana</i>	LC		LC		Yes	No
<i>Nomada facilis</i>	LC		LC		No	No
<i>Nomada fallax</i>	LC		LC		No	No
<i>Nomada femoralis</i>	LC		LC		No	No
<i>Nomada fenestrata</i>	DD		DD		No	No
<i>Nomada ferghanica</i>	DD		DD		No	No
<i>Nomada ferruginata</i>	LC		LC		Yes	No
<i>Nomada flava</i>	LC		LC		Yes	No
<i>Nomada flavigenis</i>	DD		DD		No	No
<i>Nomada flavilabris</i>	DD		DD		No	No
<i>Nomada flavinervis</i>	DD		DD		No	No
<i>Nomada flavoguttata</i>	LC		LC		No	No
<i>Nomada flavopicta</i>	LC		LC		No	No
<i>Nomada fucata</i>	LC		LC		No	No
<i>Nomada fulvicornis</i>	LC		LC		No	No
<i>Nomada furva</i>	DD		DD		No	No
<i>Nomada furvoides</i>	DD		DD		No	No
<i>Nomada fusca</i>	LC		LC		Yes	No
<i>Nomada fuscicornis</i>	LC		LC		No	No
<i>Nomada glaberrima</i>	DD		DD		No	No
<i>Nomada glaucopis</i>	LC		LC		No	No
<i>Nomada goodeniana</i>	LC		LC		No	No
<i>Nomada gransassoi</i>	DD		DD		Yes	No
<i>Nomada gredosiana</i>	DD		DD		Yes	Yes
<i>Nomada gribodoi</i>	DD		DD		No	No
<i>Nomada gruenwaldti</i>	DD		DD		Yes	Yes
<i>Nomada guttulata</i>	LC		LC		No	No
<i>Nomada hera</i>	LC		LC		No	No
<i>Nomada hirtipes</i>	LC		LC		Yes	Yes

Taxonomy	IUCN Red List Category (Europe)	IUCN Red List Criteria (Europe)	IUCN Red List Category (EU 27)	IUCN Red List Criteria (EU 27)	Endemic to Europe	Endemic to EU 27
<i>Nomada hispanica</i>	DD		DD		Yes	Yes
<i>Nomada hungarica</i>	DD		DD		No	No
<i>Nomada illustris</i>	DD		DD		Yes	No
<i>Nomada immaculata</i>	DD		DD		No	No
<i>Nomada imperialis</i>	LC		LC		No	No
<i>Nomada incisa</i>	DD		DD		No	No
<i>Nomada insignipes</i>	LC		LC		No	No
<i>Nomada integra</i>	LC		LC		No	No
<i>Nomada italica</i>	EN	B2ab(v)	EN	B2ab(v)	No	No
<i>Nomada jaramense</i>	DD		DD		Yes	Yes
<i>Nomada kervilleana</i>	DD		DD		No	No
<i>Nomada kohli</i>	LC		LC		No	No
<i>Nomada kornosica</i>	DD		DD		Yes	Yes
<i>Nomada kriesteni</i>	DD		DD		Yes	Yes
<i>Nomada lamellata</i>	DD		DD		Yes	Yes
<i>Nomada lateritia</i>	DD		DD		No	No
<i>Nomada lathburiana</i>	LC		LC		No	No
<i>Nomada laticrus</i>	DD		DD		No	No
<i>Nomada leucophthalma</i>	LC		LC		No	No
<i>Nomada limassolica</i>	DD		DD		No	No
<i>Nomada linsenmaieri</i>	LC		LC		No	No
<i>Nomada litigiosa</i>	DD		DD		No	No
<i>Nomada lucidula</i>	LC		LC		No	No
<i>Nomada maculicornis</i>	DD		DD		No	No
<i>Nomada mandibularis</i>	DD		DD		Yes	Yes
<i>Nomada marshamella</i>	LC		LC		No	No
<i>Nomada mauritanica</i>	LC		LC		No	No
<i>Nomada mavromoustakisi</i>	LC		LC		No	No
<i>Nomada melanopyga</i>	DD		DD		No	No
<i>Nomada melathoracica</i>	LC		LC		Yes	No
<i>Nomada merceti</i>	LC		LC		Yes	Yes
<i>Nomada mocsaryi</i>	DD		DD		No	No
<i>Nomada moeschleri</i>	LC		LC		No	No
<i>Nomada mutabilis</i>	LC		LC		No	No
<i>Nomada mutica</i>	NT		NT		No	No
<i>Nomada nausicaa</i>	LC		LC		No	No
<i>Nomada nesiotica</i>	DD		DD		Yes	Yes
<i>Nomada nigrovaria</i>	DD		DD		No	No
<i>Nomada nobilis</i>	LC		LC		No	No
<i>Nomada noskiewiczzi</i>	VU	B2ab(v)	VU	B2ab(v)	Yes	Yes
<i>Nomada numida</i>	LC		LC		No	No
<i>Nomada obscura</i>	LC		LC		No	No
<i>Nomada obtusifrons</i>	NT		NT		No	No
<i>Nomada oculata</i>	DD		DD		No	No
<i>Nomada opaca</i>	NT		NT		No	No
<i>Nomada orbitalis</i>	DD		DD		Yes	Yes
<i>Nomada pallispinosa</i>	DD		DD		No	No
<i>Nomada panurgina</i>	LC		LC		No	No
<i>Nomada panzeri</i>	LC		LC		No	No
<i>Nomada pastoralis</i>	DD		NE		No	No
<i>Nomada pectoralis</i>	DD		DD		No	No
<i>Nomada piccioliana</i>	LC		LC		Yes	No
<i>Nomada platythorax</i>	DD		DD		No	No
<i>Nomada pleurosticta</i>	NT		NT		No	No
<i>Nomada polemediana</i>	DD		DD		Yes	Yes
<i>Nomada posthuma</i>	DD		DD		No	No

Taxonomy	IUCN Red List Category (Europe)	IUCN Red List Criteria (Europe)	IUCN Red List Category (EU 27)	IUCN Red List Criteria (EU 27)	Endemic to Europe	Endemic to EU 27
<i>Nomada priesneri</i>	LC		LC		Yes	Yes
<i>Nomada propinqua</i>	LC		LC		No	No
<i>Nomada pruinoso</i>	DD		DD		No	No
<i>Nomada pulchra</i>	EN	B2ab(ii,v)	EN	B2ab(ii,v)	No	No
<i>Nomada pygidialis</i>	LC		LC		No	No
<i>Nomada rhenana</i>	NT		NT		No	No
<i>Nomada roberjeotiana</i>	NT		NT		No	No
<i>Nomada rostrata</i>	DD		DD		No	No
<i>Nomada rubiginosa</i>	LC		LC		No	No
<i>Nomada rubricollis</i>	LC		LC		No	No
<i>Nomada rubricoxa</i>	DD		DD		Yes	Yes
<i>Nomada rubriventris</i>	DD		DD		No	No
<i>Nomada ruficornis</i>	LC		LC		No	No
<i>Nomada rufipes</i>	LC		LC		No	No
<i>Nomada rufoabdominalis</i>	DD		DD		Yes	Yes
<i>Nomada sabulosa</i>	DD		DD		No	No
<i>Nomada sanguinea</i>	LC		LC		No	No
<i>Nomada scheuchli</i>	DD		DD		No	No
<i>Nomada serricornis</i>	DD		DD		No	No
<i>Nomada sexfasciata</i>	LC		LC		No	No
<i>Nomada sheppardana</i>	LC		LC		No	No
<i>Nomada siciliensis</i>	CR	D	CR	D	Yes	Yes
<i>Nomada sicula</i>	DD		DD		Yes	Yes
<i>Nomada signata</i>	LC		LC		Yes	No
<i>Nomada similis</i>	LC		LC		Yes	No
<i>Nomada standfussi</i>	DD		DD		Yes	Yes
<i>Nomada stigma</i>	LC		LC		No	No
<i>Nomada stoeckherti</i>	DD		DD		No	No
<i>Nomada striata</i>	LC		LC		No	No
<i>Nomada succincta</i>	LC		LC		No	No
<i>Nomada sybarita</i>	DD		DD		No	No
<i>Nomada symphyti</i>	NT		NT		No	No
<i>Nomada tenella</i>	NT		NT		No	No
<i>Nomada thersites</i>	DD		DD		No	No
<i>Nomada transitoria</i>	LC		LC		No	No
<i>Nomada trapeziformis</i>	NT		NT		No	No
<i>Nomada tridentirostris</i>	LC		LC		No	No
<i>Nomada trispinosa</i>	LC		LC		No	No
<i>Nomada umbrosa</i>	DD		DD		No	No
<i>Nomada unispinosa</i>	DD		DD		No	No
<i>Nomada verna</i>	DD		DD		Yes	No
<i>Nomada villosa</i>	NT		NT		No	No
<i>Nomada zonata</i>	LC		LC		No	No
<i>Parammobatodes maroccanus</i>	DD		DD		No	No
<i>Parammobatodes minutus</i>	EN	B2ab(iii)	EN	B2ab(iii)	No	No
<i>Pasites maculatus</i>	LC		LC		No	No
<i>Schmiedeknechtia oraniensis</i>	DD		DD		No	No
<i>Tarsalia ancyliformis</i>	DD		DD		No	No
<i>Tarsalia hirtipes</i>	DD		DD		No	No
<i>Tetralonia malvae</i>	LC		LC		No	No
<i>Tetraloniella alticincta</i>	LC		LC		No	No
<i>Tetraloniella cinctella</i>	DD		DD		No	No
<i>Tetraloniella dentata</i>	LC		LC		No	No
<i>Tetraloniella fulvescens</i>	DD		DD		No	No
<i>Tetraloniella glauca</i>	DD		DD		No	No

Taxonomy	IUCN Red List Category (IUCN)	IUCN Red List Criteria (Europe)	IUCN Red List Category (EU 27)	IUCN Red List Criteria (EU 27)	Endemic to Europe	Endemic to EU 27
<i>Tetraloniella graja</i>	DD		DD		No	No
<i>Tetraloniella hohmanni</i>	DD		DD		Yes	Yes
<i>Tetraloniella iberica</i>	DD		DD		No	No
<i>Tetraloniella inulae</i>	DD		DD		No	No
<i>Tetraloniella julliani</i>	DD		DD		No	No
<i>Tetraloniella lanzarotensis</i>	DD		DD		Yes	Yes
<i>Tetraloniella lyncea</i>	DD		DD		Yes	No
<i>Tetraloniella nana</i>	DD		DD		No	No
<i>Tetraloniella pollinosa</i>	DD		DD		No	No
<i>Tetraloniella ruficornis</i>	DD		DD		No	No
<i>Tetraloniella salicariae</i>	DD		DD		No	No
<i>Tetraloniella scabiosae</i>	DD		DD		No	No
<i>Tetraloniella strigata</i>	DD		DD		No	No
<i>Tetraloniella vicina</i>	DD		NE		No	No
<i>Thyreus affinis</i>	DD		DD		No	No
<i>Thyreus elegans</i>	DD		DD		No	No
<i>Thyreus hellenicus</i>	DD		DD		No	No
<i>Thyreus hirtus</i>	DD		DD		No	No
<i>Thyreus histrionicus</i>	LC		LC		No	No
<i>Thyreus hohmanni</i>	DD		DD		Yes	Yes
<i>Thyreus orbatus</i>	LC		LC		No	No
<i>Thyreus picaron</i>	DD		DD		No	No
<i>Thyreus ramosus</i>	LC		LC		No	No
<i>Thyreus scutellaris</i>	DD		DD		No	No
<i>Thyreus tricuspis</i>	DD		DD		No	No
<i>Thyreus truncatus</i>	DD		DD		No	No
<i>Triepeolus tristis</i>	NT		NT		No	No
<i>Xylocopa cantabrita</i>	LC		LC		No	No
<i>Xylocopa iris</i>	LC		LC		No	No
<i>Xylocopa olivieri</i>	LC		LC		No	No
<i>Xylocopa valga</i>	LC		LC		No	No
<i>Xylocopa violacea</i>	LC		LC		No	No
COLLETIDAE						
<i>Colletes abeillei</i>	LC		LC		No	No
<i>Colletes acutiformis</i>	NA		NA		No	No
<i>Colletes acutus</i>	LC		LC		No	No
<i>Colletes albomaculatus</i>	NT		NT		No	No
<i>Colletes anchlussae</i>	EN	B2ab(ii,iii)	EN	B2ab(ii,iii)	No	No
<i>Colletes brevigena</i>	LC		LC		No	No
<i>Colletes canescens</i>	DD		DD		No	No
<i>Colletes carinatus</i>	LC		LC		No	No
<i>Colletes cariniger</i>	LC		LC		No	No
<i>Colletes caskanus</i>	DD		DD		No	No
<i>Colletes caspicus</i>	EN	B2ab(i,iii)	EN	B2ab(i,iii)	No	No
<i>Colletes chengtehensis</i>	VU	B2ab(iii)	EN	B2ab(iii)	No	No
<i>Colletes collaris</i>	EN	B2ab(ii,iii)	EN	B2ab(ii,iii)	No	No
<i>Colletes creticus</i>	NT		NT		Yes	Yes
<i>Colletes cunicularius</i>	LC		LC		No	No
<i>Colletes cyprius</i>	NT		NT		Yes	Yes
<i>Colletes daviesanus</i>	LC		LC		No	No
<i>Colletes dimidiatus</i>	VU	B1ab(ii,iii)+2ab(ii,iii)	VU	B1ab(ii,iii)+2ab(ii,iii)	Yes	Yes
<i>Colletes dinizi</i>	DD		DD		Yes	Yes
<i>Colletes dusmeti</i>	LC		LC		No	No
<i>Colletes eous</i>	LC		LC		No	No
<i>Colletes escalerae</i>	NA		NA		No	No
<i>Colletes floralis</i>	VU	B2ab(ii,iii)	VU	B2ab(ii,iii)	No	No

Taxonomy	IUCN Red List Category (Europe)	IUCN Red List Criteria (Europe)	IUCN Red List Category (EU 27)	IUCN Red List Criteria (EU 27)	Endemic to Europe	Endemic to EU 27
<i>Colletes fodiens</i>	VU	B2ab(ii,iii)	VU	B2ab(ii,iii)	No	No
<i>Colletes foveolaris</i>	LC		LC		No	No
<i>Colletes gallicus</i>	LC		LC		No	No
<i>Colletes graeffei</i>	EN	B2ab(ii,iii)	EN	B2ab(ii,iii)	No	No
<i>Colletes halophilus</i>	NT		NT		Yes	Yes
<i>Colletes hederiae</i>	LC		LC		Yes	No
<i>Colletes hethiticus</i>	DD		DD		No	No
<i>Colletes hylaeiformis</i>	LC		LC		No	No
<i>Colletes impunctatus</i>	VU	B2ab(ii,iii)	VU	B2ab(ii,iii)	No	No
<i>Colletes inexpectatus</i>	LC		LC		No	No
<i>Colletes intricans</i>	NA		NA		No	No
<i>Colletes ligatus</i>	LC		LC		No	No
<i>Colletes maidli</i>	LC		LC		No	No
<i>Colletes marginatus</i>	LC		LC		No	No
<i>Colletes merceti</i>	EN	B2ab(iii)	EN	B2ab(iii)	Yes	Yes
<i>Colletes meyeri</i>	EN	B2ab(ii,iii)	EN	B2ab(ii,iii)	No	No
<i>Colletes mlokoszewiczi</i>	LC		LC		No	No
<i>Colletes moricei</i>	VU	B1ab(ii,iii)+2ab(ii,iii)	VU	B1ab(ii,iii)+2ab(ii,iii)	Yes	Yes
<i>Colletes nasutus</i>	EN	B2ab(ii,iii)	EN	B2ab(ii,iii)	No	No
<i>Colletes nigricans</i>	LC		LC		No	No
<i>Colletes noskiewiczzi</i>	LC		LC		No	No
<i>Colletes pannonicus</i>	LC		LC		Yes	Yes
<i>Colletes perezi</i>	VU	B1ab(ii,iii)+2ab(ii,iii)	VU	B1ab(ii,iii)+2ab(ii,iii)	No	No
<i>Colletes pulchellus</i>	VU	B2ab(ii,iii)	VU	B2ab(ii,iii)	Yes	Yes
<i>Colletes punctatus</i>	EN	B2ab(ii,iii)	EN	B2ab(ii,iii)	No	No
<i>Colletes schmidi</i>	LC		LC		Yes	Yes
<i>Colletes senilis</i>	DD		DD		No	No
<i>Colletes sidemii</i>	NA		NE		No	No
<i>Colletes sierrensis</i>	EN	B2ab(ii,iii)	EN	B2ab(ii,iii)	Yes	No
<i>Colletes similis</i>	LC		LC		No	No
<i>Colletes squamulosus</i>	DD		DD		No	No
<i>Colletes standfussi</i>	DD		DD		Yes	Yes
<i>Colletes succinctus</i>	NT		NT		No	No
<i>Colletes tardus</i>	DD		DD		Yes	No
<i>Colletes tuberculatus</i>	LC		LC		No	No
<i>Colletes tuberculiger</i>	LC		LC		Yes	Yes
<i>Colletes wolffi</i>	EN	B2ab(ii,iii)	EN	B2ab(ii,iii)	Yes	Yes
<i>Hylaeus absolutus</i>	DD		DD		No	No
<i>Hylaeus adriaticus</i>	DD		DD		Yes	No
<i>Hylaeus alpinus</i>	DD		DD		Yes	No
<i>Hylaeus angustatus</i>	LC		LC		No	No
<i>Hylaeus annularis</i>	DD		DD		No	No
<i>Hylaeus annulatus</i>	DD		DD		No	No
<i>Hylaeus ater</i>	LC		LC		Yes	Yes
<i>Hylaeus azonae</i>	DD		DD		Yes	Yes
<i>Hylaeus biarmicus</i>	DD		DD		No	No
<i>Hylaeus bifasciatus</i>	DD		DD		No	No
<i>Hylaeus brachycephalus</i>	DD		DD		No	No
<i>Hylaeus breviceps</i>	DD		NE		No	No
<i>Hylaeus brevicornis</i>	LC		LC		No	No
<i>Hylaeus canariensis</i>	DD		DD		Yes	Yes
<i>Hylaeus cardioscapus</i>	DD		DD		No	No
<i>Hylaeus chypearis</i>	LC		LC		No	No
<i>Hylaeus communis</i>	LC		LC		No	No
<i>Hylaeus conformis</i>	DD		DD		No	No
<i>Hylaeus confusus</i>	LC		LC		No	No

Taxonomy	IUCN Red List Category (Europe)	IUCN Red List Criteria (Europe)	IUCN Red List Category (EU 27)	IUCN Red List Criteria (EU 27)	Endemic to Europe	Endemic to EU 27
<i>Hylaemus convergens</i>	DD		DD		Yes	Yes
<i>Hylaemus coriaceus</i>	DD		DD		No	No
<i>Hylaemus cornutus</i>	LC		LC		No	No
<i>Hylaemus crassanus</i>	NT		NT		Yes	No
<i>Hylaemus cypricola</i>	DD		DD		No	No
<i>Hylaemus deceptorius</i>	DD		DD		Yes	Yes
<i>Hylaemus difformis</i>	LC		LC		No	No
<i>Hylaemus dilatatus</i>	LC		LC		No	No
<i>Hylaemus duckei</i>	DD		DD		No	No
<i>Hylaemus euryscapus</i>	DD		DD		No	No
<i>Hylaemus friesei</i>	NT		NT		Yes	No
<i>Hylaemus garrulus</i>	DD		DD		Yes	Yes
<i>Hylaemus gazagnairei</i>	NA		NA		No	No
<i>Hylaemus gibbus</i>	LC		LC		No	No
<i>Hylaemus glacialis</i>	DD		DD		No	No
<i>Hylaemus gracilicornis</i>	LC		LC		No	No
<i>Hylaemus gredleri</i>	LC		LC		No	No
<i>Hylaemus hellenicus</i>	DD		DD		Yes	Yes
<i>Hylaemus bohmanni</i>	DD		DD		Yes	Yes
<i>Hylaemus hyalinatus</i>	LC		LC		No	No
<i>Hylaemus hyperpunctatus</i>	DD		DD		Yes	No
<i>Hylaemus ibericus</i>	DD		DD		Yes	Yes
<i>Hylaemus imparilis</i>	LC		LC		No	No
<i>Hylaemus incongruus</i>	DD		DD		No	No
<i>Hylaemus intermedius</i>	DD		DD		No	No
<i>Hylaemus kahri</i>	DD		DD		No	No
<i>Hylaemus koenigsmanni</i>	DD		DD		Yes	Yes
<i>Hylaemus leptocephalus</i>	LC		LC		No	No
<i>Hylaemus lineolatus</i>	LC		LC		No	No
<i>Hylaemus longimaculus</i>	LC		LC		No	No
<i>Hylaemus maderensis</i>	DD		DD		Yes	Yes
<i>Hylaemus meridionalis</i>	DD		DD		No	No
<i>Hylaemus milossus</i>	DD		DD		Yes	Yes
<i>Hylaemus moricei</i>	LC		LC		No	No
<i>Hylaemus nigritus</i>	LC		LC		No	No
<i>Hylaemus nivaliformis</i>	DD		DD		Yes	No
<i>Hylaemus nivalis</i>	DD		DD		Yes	No
<i>Hylaemus paulus</i>	LC		LC		No	No
<i>Hylaemus pectoralis</i>	DD		DD		No	No
<i>Hylaemus penalaris</i>	DD		DD		Yes	Yes
<i>Hylaemus pfankuchi</i>	LC		LC		No	No
<i>Hylaemus pictipes</i>	LC		LC		No	No
<i>Hylaemus pictus</i>	DD		DD		Yes	Yes
<i>Hylaemus pilosulus</i>	DD		DD		No	No
<i>Hylaemus praenotatus</i>	DD		DD		No	No
<i>Hylaemus punctatus</i>	LC		LC		No	No
<i>Hylaemus punctulatissimus</i>	DD		DD		No	No
<i>Hylaemus punctus</i>	DD		DD		No	No
<i>Hylaemus pyrenaicus</i>	DD		DD		Yes	Yes
<i>Hylaemus rinki</i>	LC		LC		No	No
<i>Hylaemus rubicola</i>	DD		DD		No	No
<i>Hylaemus rugicollis</i>	DD		DD		No	No
<i>Hylaemus scutellaris</i>	DD		NE		No	No
<i>Hylaemus scutellatus</i>	DD		DD		No	No
<i>Hylaemus sidensis</i>	DD		DD		No	No
<i>Hylaemus signatus</i>	LC		LC		No	No

Taxonomy	IUCN Red List Category (Europe)	IUCN Red List Criteria (Europe)	IUCN Red List Category (EU 27)	IUCN Red List Criteria (EU 27)	Endemic to Europe	Endemic to EU 27
<i>Hylaeus sinuatus</i>	LC		LC		No	No
<i>Hylaeus soror</i>	DD		DD		No	No
<i>Hylaeus stigmorhinus</i>	DD		DD		Yes	Yes
<i>Hylaeus styriacus</i>	DD		DD		No	No
<i>Hylaeus sulphuripes</i>	LC		LC		No	No
<i>Hylaeus taeniolatus</i>	LC		LC		No	No
<i>Hylaeus teruelus</i>	DD		DD		Yes	Yes
<i>Hylaeus trifidus</i>	DD		DD		No	No
<i>Hylaeus trinotatus</i>	DD		DD		No	No
<i>Hylaeus tyrolensis</i>	DD		DD		No	No
<i>Hylaeus variegatus</i>	LC		LC		No	No
HALICTIDAE						
<i>Cealylictus variegatus</i>	LC		LC		No	No
<i>Dufourea alpina</i>	LC		LC		Yes	No
<i>Dufourea coeruleocephala</i>	DD		DD		Yes	No
<i>Dufourea cypria</i>	DD		DD		No	No
<i>Dufourea dentiventris</i>	NT		NT		No	No
<i>Dufourea fortunata</i>	DD		DD		Yes	Yes
<i>Dufourea gaullei</i>	DD		DD		No	No
<i>Dufourea graeca</i>	DD		DD		No	No
<i>Dufourea halictula</i>	NT		NT		No	No
<i>Dufourea inermis</i>	NT		NT		No	No
<i>Dufourea iris</i>	DD		DD		Yes	Yes
<i>Dufourea longiglossa</i>	DD		DD		Yes	Yes
<i>Dufourea lusitanica</i>	DD		DD		Yes	Yes
<i>Dufourea merceti</i>	DD		DD		Yes	Yes
<i>Dufourea minuta</i>	NT		NT		No	No
<i>Dufourea paradoxa</i>	LC		LC		No	No
<i>Dufourea styx</i>	DD		DD		Yes	No
<i>Dufourea trautmanni</i>	DD		DD		Yes	Yes
<i>Dufourea wolffi</i>	DD		DD		No	No
<i>Halictus adjikenticus</i>	DD		DD		No	No
<i>Halictus alfenellus</i>	DD		DD		No	No
<i>Halictus asperulus</i>	DD		DD		No	No
<i>Halictus brunnescens</i>	DD		DD		No	No
<i>Halictus carinthiacus</i>	EN	B2ab(i,ii,iii)	EN	B2ab(i,ii,iii)	Yes	No
<i>Halictus centaureae</i>	DD		DD		Yes	No
<i>Halictus cephalicus</i>	LC		LC		No	No
<i>Halictus cochlearitarsis</i>	LC		LC		No	No
<i>Halictus compressus</i>	LC		LC		No	No
<i>Halictus concinnus</i>	LC		LC		Yes	Yes
<i>Halictus confusus</i>	LC		LC		No	No
<i>Halictus consobrinus</i>	DD		DD		No	No
<i>Halictus constantinensis</i>	DD		DD		No	No
<i>Halictus crenicornis</i>	DD		DD		Yes	Yes
<i>Halictus cypricus</i>	DD		DD		No	No
<i>Halictus fatsensis</i>	DD		DD		No	No
<i>Halictus frontalis</i>	LC		LC		Yes	Yes
<i>Halictus fulvipes</i>	LC		LC		No	No
<i>Halictus fumatipennis</i>	DD		DD		Yes	Yes
<i>Halictus gavarnicus</i>	LC		LC		No	No
<i>Halictus gemmeus</i>	LC		LC		No	No
<i>Halictus graecus</i>	DD		DD		No	No
<i>Halictus grossellus</i>	DD		DD		No	No
<i>Halictus gruenwaldti</i>	DD		DD		Yes	Yes
<i>Halictus holomelaenus</i>	DD		DD		Yes	Yes

Taxonomy	IUCN Red List Category (Europe)	IUCN Red List Criteria (Europe)	IUCN Red List Category (EU 27)	IUCN Red List Criteria (EU 27)	Endemic to Europe	Endemic to EU 27
<i>Halictus inpilosus</i>	DD		DD		Yes	Yes
<i>Halictus jaramielicus</i>	DD		DD		Yes	Yes
<i>Halictus kessleri</i>	LC		LC		No	No
<i>Halictus langobardicus</i>	LC		LC		Yes	No
<i>Halictus leucabeneus</i>	VU	B2ab(iii,v)	VU	B2ab(iii,v)	No	No
<i>Halictus luganicus</i>	DD		DD		No	No
<i>Halictus lussinicus</i>	DD		DD		Yes	No
<i>Halictus maculatus</i>	LC		LC		No	No
<i>Halictus mediterraneus</i>	DD		DD		Yes	Yes
<i>Halictus microcardia</i>	EN	B1ab(iii,v)+2ab(iii,v)	EN	B1ab(iii,v)+2ab(iii,v)	Yes	Yes
<i>Halictus mucoreus</i>	DD		NE		No	No
<i>Halictus nicosiae</i>	DD		DD		Yes	Yes
<i>Halictus patellatus</i>	LC		LC		No	No
<i>Halictus pollinosus</i>	LC		LC		No	No
<i>Halictus ponticus</i>	DD		DD		Yes	No
<i>Halictus pseudomucoreus</i>	DD		NE		No	No
<i>Halictus pseudotetrazonius</i>	DD		DD		Yes	Yes
<i>Halictus pyrenaicus</i>	DD		DD		Yes	Yes
<i>Halictus quadricinctus</i>	NT		NT		No	No
<i>Halictus quadripartitus</i>	DD		DD		Yes	Yes
<i>Halictus resurgens</i>	LC		LC		No	No
<i>Halictus rossicus</i>	DD		DD		Yes	No
<i>Halictus rubicundus</i>	LC		LC		No	No
<i>Halictus saji</i>	DD		DD		No	No
<i>Halictus scabiosae</i>	LC		LC		No	No
<i>Halictus seladonius</i>	LC		LC		No	No
<i>Halictus semitectus</i>	EN	B2ab(v)	EN	B2ab(v)	No	No
<i>Halictus senilis</i>	DD		DD		No	No
<i>Halictus sexcinctus</i>	LC		LC		No	No
<i>Halictus simplex</i>	LC		LC		No	No
<i>Halictus smaragdulus</i>	LC		LC		No	No
<i>Halictus subauratus</i>	LC		LC		No	No
<i>Halictus tetrazonianellus</i>	DD		DD		No	No
<i>Halictus tetrazonius</i>	DD		DD		No	No
<i>Halictus tridivisus</i>	DD		DD		Yes	Yes
<i>Halictus tuberculatus</i>	DD		NE		No	No
<i>Halictus tumulorum</i>	LC		LC		No	No
<i>Halictus vestitus</i>	LC		LC		No	No
<i>Lasioglossum acephaloides</i>	DD		DD		No	No
<i>Lasioglossum aegyptiellum</i>	DD		DD		No	No
<i>Lasioglossum aeratum</i>	LC		LC		No	No
<i>Lasioglossum akroundicum</i>	DD		DD		Yes	Yes
<i>Lasioglossum albipes</i>	LC		LC		No	No
<i>Lasioglossum albocinctum</i>	LC		LC		No	No
<i>Lasioglossum albovirens</i>	NT		NT		No	No
<i>Lasioglossum algerum</i>	NT		NT		No	No
<i>Lasioglossum alinense</i>	DD		NE		No	No
<i>Lasioglossum alpigenum</i>	LC		LC		Yes	No
<i>Lasioglossum anellum</i>	DD		DD		No	No
<i>Lasioglossum angusticeps</i>	NT		NT		No	No
<i>Lasioglossum angustipes</i>	DD		DD		No	No
<i>Lasioglossum annulipes</i>	NA		NA		No	No
<i>Lasioglossum apostoli</i>	DD		DD		No	No
<i>Lasioglossum arctifrons</i>	LC		LC		Yes	Yes
<i>Lasioglossum ariadne</i>	DD		DD		Yes	Yes
<i>Lasioglossum articulare</i>	DD		DD		No	No

Taxonomy	IUCN Red List Category (Europe)	IUCN Red List Criteria (Europe)	IUCN Red List Category (EU 27)	IUCN Red List Criteria (EU 27)	Endemic to Europe	Endemic to EU 27
<i>Lasioglossum aureimontanum</i>	DD		DD		Yes	Yes
<i>Lasioglossum aureolum</i>	LC		LC		No	No
<i>Lasioglossum bavaricum</i>	LC		LC		Yes	No
<i>Lasioglossum bicallosum</i>	DD		DD		No	No
<i>Lasioglossum bimaculatum</i>	LC		LC		No	No
<i>Lasioglossum bischoffi</i>	DD		DD		No	No
<i>Lasioglossum bluethgeni</i>	LC		LC		No	No
<i>Lasioglossum boreale</i>	DD		DD		No	No
<i>Lasioglossum brevicorne</i>	NT		NT		No	No
<i>Lasioglossum breviventre</i>	EN	B2ab(i,ii,v)	EN	B2ab(i,ii,v)	Yes	No
<i>Lasioglossum buccale</i>	DD		DD		No	No
<i>Lasioglossum calceatum</i>	LC		LC		No	No
<i>Lasioglossum callizonium</i>	LC		LC		No	No
<i>Lasioglossum capitale</i>	DD		DD		No	No
<i>Lasioglossum castilianum</i>	DD		DD		Yes	Yes
<i>Lasioglossum chalcodes</i>	LC		LC		Yes	Yes
<i>Lasioglossum chypeare</i>	NT		NT		No	No
<i>Lasioglossum chypeiferellum</i>	DD		DD		No	No
<i>Lasioglossum collopiense</i>	DD		DD		No	No
<i>Lasioglossum convexiusculum</i>	NT		NT		No	No
<i>Lasioglossum corsicanum</i>	DD		DD		Yes	Yes
<i>Lasioglossum corvinum</i>	LC		LC		No	No
<i>Lasioglossum costulatum</i>	NT		NT		No	No
<i>Lasioglossum crassepunctatum</i>	DD		DD		No	No
<i>Lasioglossum cristula</i>	DD		DD		No	No
<i>Lasioglossum cupromicans</i>	LC		LC		No	No
<i>Lasioglossum damascenum</i>	DD		DD		No	No
<i>Lasioglossum danuvium</i>	DD		DD		Yes	No
<i>Lasioglossum debilior</i>	NA		NA		No	No
<i>Lasioglossum denislucum</i>	DD		DD		No	No
<i>Lasioglossum discum</i>	LC		LC		No	No
<i>Lasioglossum dolichocephalum</i>	NT		NT		No	No
<i>Lasioglossum duckei</i>	NT		NT		No	No
<i>Lasioglossum dusmeti</i>	DD		DD		Yes	Yes
<i>Lasioglossum elegans</i>	DD		DD		No	No
<i>Lasioglossum ellipticeps</i>	NA		NA		No	No
<i>Lasioglossum erraticum</i>	DD		DD		No	No
<i>Lasioglossum euboense</i>	DD		DD		No	No
<i>Lasioglossum eurasicum</i>	DD		DD		Yes	No
<i>Lasioglossum euxinicum</i>	DD		DD		No	No
<i>Lasioglossum fratellum</i>	LC		LC		No	No
<i>Lasioglossum fulvicorne</i>	LC		LC		No	No
<i>Lasioglossum glabriusculum</i>	LC		LC		No	No
<i>Lasioglossum glaciegenitum</i>	DD		DD		No	No
<i>Lasioglossum gorkiense</i>	NA		NE		No	No
<i>Lasioglossum griseolum</i>	LC		LC		No	No
<i>Lasioglossum haesitans</i>	DD		DD		No	No
<i>Lasioglossum hilare</i>	DD		DD		No	No
<i>Lasioglossum ibericum</i>	DD		DD		Yes	Yes
<i>Lasioglossum imbecillum</i>	DD		DD		No	No
<i>Lasioglossum immunitum</i>	DD		DD		No	No
<i>Lasioglossum intermedium</i>	NT		NT		No	No

Taxonomy	IUCN Red List Category (Europe)	IUCN Red List Criteria (Europe)	IUCN Red List Category (EU 27)	IUCN Red List Criteria (EU 27)	Endemic to Europe	Endemic to EU 27
<i>Lasioglossum interruptum</i>	LC		LC		No	No
<i>Lasioglossum kotschy</i>	DD		DD		Yes	Yes
<i>Lasioglossum kussariense</i>	DD		DD		No	No
<i>Lasioglossum laetum</i>	LC		LC		Yes	Yes
<i>Lasioglossum laeve</i>	EN	B2ab(i,ii,iv)	EN	B2ab(i,ii,iv)	No	No
<i>Lasioglossum laevidorsum</i>	DD		DD		No	No
<i>Lasioglossum laevigatum</i>	NT		NT		No	No
<i>Lasioglossum laterale</i>	DD		DD		No	No
<i>Lasioglossum laticeps</i>	LC		LC		No	No
<i>Lasioglossum lativentre</i>	LC		LC		No	No
<i>Lasioglossum leucomontanum</i>	DD		DD		Yes	Yes
<i>Lasioglossum leucopus</i>	LC		LC		No	No
<i>Lasioglossum leucozonium</i>	LC		LC		No	No
<i>Lasioglossum limbelloides</i>	DD		DD		No	No
<i>Lasioglossum limbellum</i>	DD		DD		No	No
<i>Lasioglossum lineare</i>	DD		DD		No	No
<i>Lasioglossum lissonotum</i>	DD		DD		Yes	No
<i>Lasioglossum littorale</i>	NT		NT		No	No
<i>Lasioglossum lucidulum</i>	LC		LC		No	No
<i>Lasioglossum majus</i>	NT		NT		No	No
<i>Lasioglossum malachurum</i>	LC		LC		No	No
<i>Lasioglossum mandibulare</i>	NT		NT		No	No
<i>Lasioglossum marginatum</i>	LC		LC		No	No
<i>Lasioglossum marginellum</i>	NT		NT		No	No
<i>Lasioglossum maurusium</i>	NT		NT		No	No
<i>Lasioglossum mediterraneum</i>	LC		LC		No	No
<i>Lasioglossum mesosclerum</i>	DD		DD		No	No
<i>Lasioglossum minutissimum</i>	LC		LC		No	No
<i>Lasioglossum minutulum</i>	NT		NT		Yes	No
<i>Lasioglossum montivolans</i>	DD		DD		No	No
<i>Lasioglossum morio</i>	LC		LC		No	No
<i>Lasioglossum musculooides</i>	DD		DD		No	No
<i>Lasioglossum nigripes</i>	LC		LC		No	No
<i>Lasioglossum nitidiusculum</i>	LC		LC		No	No
<i>Lasioglossum nitidulum</i>	LC		LC		No	No
<i>Lasioglossum niveocinctum</i>	NA		NE		No	No
<i>Lasioglossum obscuratum</i>	DD		DD		No	No
<i>Lasioglossum orihuelicum</i>	DD		DD		Yes	Yes
<i>Lasioglossum pallens</i>	LC		LC		No	No
<i>Lasioglossum parvulum</i>	LC		LC		No	No
<i>Lasioglossum pauperatum</i>	LC		LC		No	No
<i>Lasioglossum pauxillum</i>	LC		LC		No	No
<i>Lasioglossum perclavipes</i>	DD		DD		No	No
<i>Lasioglossum peregrinum</i>	DD		DD		No	No
<i>Lasioglossum phoenicicum</i>	DD		DD		No	No
<i>Lasioglossum pleurospeculum</i>	DD		DD		Yes	No
<i>Lasioglossum podolicum</i>	NT		NT		No	No
<i>Lasioglossum politum</i>	LC		LC		No	No
<i>Lasioglossum prasinum</i>	NT		NT		No	No
<i>Lasioglossum pseudocaspicum</i>	DD		DD		No	No
<i>Lasioglossum pseudoplanulum</i>	DD		DD		No	No
<i>Lasioglossum punctatissimum</i>	LC		LC		No	No

Taxonomy	IUCN Red List Category (Europe)	IUCN Red List Criteria (Europe)	IUCN Red List Category (EU 27)	IUCN Red List Criteria (EU 27)	Endemic to Europe	Endemic to EU 27
<i>Lasioglossum puncticolle</i>	LC		LC		No	No
<i>Lasioglossum pygmaeum</i>	NT		NT		No	No
<i>Lasioglossum quadrinotatulum</i>	NT		NT		No	No
<i>Lasioglossum quadrinotatum</i>	NT		NT		No	No
<i>Lasioglossum quadrisignatum</i>	EN	B2ab(i,ii)	EN	B2ab(i,ii)	No	No
<i>Lasioglossum ragusanum</i>	DD		DD		Yes	No
<i>Lasioglossum rostratum</i>	NA		NE		No	No
<i>Lasioglossum rufitarse</i>	LC		LC		No	No
<i>Lasioglossum rupestre</i>	DD		DD		No	No
<i>Lasioglossum sabulosum</i>	NT		NT		Yes	No
<i>Lasioglossum samaricum</i>	DD		DD		No	No
<i>Lasioglossum semilucens</i>	LC		LC		No	No
<i>Lasioglossum setulellum</i>	NT		NT		No	No
<i>Lasioglossum setulosum</i>	NT		NT		Yes	No
<i>Lasioglossum sexmaculatum</i>	EN	B2ab(iii,v)	EN	B2ab(iii,v)	No	No
<i>Lasioglossum sexnotatulum</i>	EN	B2ab(v)	EN	B2ab(v)	No	No
<i>Lasioglossum sexnotatum</i>	NT		NT		No	No
<i>Lasioglossum sexstrigatum</i>	LC		LC		No	No
<i>Lasioglossum smeathmanellum</i>	LC		LC		No	No
<i>Lasioglossum soror</i>	EN	B2ab(iii)	EN	B2ab(iii)	No	No
<i>Lasioglossum sphaecodimorphum</i>	DD		DD		No	No
<i>Lasioglossum strictifrons</i>	DD		DD		No	No
<i>Lasioglossum subaenescens</i>	NT		NT		No	No
<i>Lasioglossum subfasciatum</i>	EN	B2ab(i,ii,v)	EN	B2ab(i,ii,v)	No	No
<i>Lasioglossum subfulvicorne</i>	LC		LC		No	No
<i>Lasioglossum subhirtum</i>	LC		LC		No	No
<i>Lasioglossum tarsatum</i>	NT		NT		No	No
<i>Lasioglossum tauricum</i>	DD		DD		Yes	No
<i>Lasioglossum transitorium</i>	LC		LC		No	No
<i>Lasioglossum trichopygum</i>	DD		DD		No	No
<i>Lasioglossum tricinctum</i>	DD		DD		No	No
<i>Lasioglossum truncaticolle</i>	DD		DD		No	No
<i>Lasioglossum tschibuklinum</i>	DD		DD		No	No
<i>Lasioglossum vergilianum</i>	DD		DD		Yes	Yes
<i>Lasioglossum villosulum</i>	LC		LC		No	No
<i>Lasioglossum virens</i>	EN	B2ab(iii)	EN	B2ab(iii)	No	No
<i>Lasioglossum viride</i>	LC		LC		Yes	Yes
<i>Lasioglossum wollastoni</i>	LC		LC		Yes	Yes
<i>Lasioglossum xanthopus</i>	NT		NT		No	No
<i>Lasioglossum zonulum</i>	LC		LC		No	No
<i>Nomiapis bispinosa</i>	LC		LC		No	No
<i>Nomiapis diversipes</i>	LC		LC		No	No
<i>Nomiapis equestris</i>	DD		DD		No	No
<i>Nomiapis femoralis</i>	DD		DD		No	No
<i>Nomiapis monstrosa</i>	DD		DD		No	No
<i>Nomiapis valga</i>	DD		DD		No	No
<i>Nomioides deceptor</i>	LC		LC		No	No
<i>Nomioides facilis</i>	LC		LC		No	No
<i>Nomioides fortunatus</i>	LC		LC		No	No
<i>Nomioides minutissimus</i>	LC		LC		No	No
<i>Rhophitoides canus</i>	LC		LC		No	No
<i>Rhophitoides epiroticus</i>	DD		DD		Yes	No

Taxonomy	IUCN Red List Category (Europe)	IUCN Red List Criteria (Europe)	IUCN Red List Category (EU 27)	IUCN Red List Criteria (EU 27)	Endemic to Europe	Endemic to EU 27
<i>Rophites algeris</i>	DD		DD		No	No
<i>Rophites clypealis</i>	DD		NE		No	No
<i>Rophites foveolatus</i>	DD		DD		No	No
<i>Rophites hartmanni</i>	DD		DD		No	No
<i>Rophites hellenicus</i>	DD		DD		Yes	No
<i>Rophites leclercqi</i>	DD		DD		No	No
<i>Rophites quinquespinosus</i>	NT		NT		No	No
<i>Rophites thracius</i>	DD		DD		Yes	Yes
<i>Sphcodes albilabris</i>	LC		LC		No	No
<i>Sphcodes algeriensis</i>	DD		DD		No	No
<i>Sphcodes alternatus</i>	LC		LC		No	No
<i>Sphcodes anatolicus</i>	DD		DD		No	No
<i>Sphcodes atlanticus</i>	DD		DD		Yes	Yes
<i>Sphcodes barbatus</i>	DD		DD		No	No
<i>Sphcodes combai</i>	DD		DD		Yes	Yes
<i>Sphcodes crassanus</i>	LC		LC		No	No
<i>Sphcodes crassus</i>	LC		LC		No	No
<i>Sphcodes creticus</i>	DD		DD		Yes	Yes
<i>Sphcodes cristatus</i>	NT		NT		No	No
<i>Sphcodes croaticus</i>	NT		NT		No	No
<i>Sphcodes cypricus</i>	DD		DD		Yes	Yes
<i>Sphcodes dusmeti</i>	DD		DD		No	No
<i>Sphcodes ephippius</i>	LC		LC		No	No
<i>Sphcodes ferruginatus</i>	LC		LC		No	No
<i>Sphcodes geoffrellus</i>	LC		LC		No	No
<i>Sphcodes gibbus</i>	LC		LC		No	No
<i>Sphcodes gomerensis</i>	DD		DD		Yes	Yes
<i>Sphcodes hirtellus</i>	DD		DD		No	No
<i>Sphcodes hyalinatus</i>	NT		NT		No	No
<i>Sphcodes intermedius</i>	NT		NT		No	No
<i>Sphcodes larochei</i>	DD		DD		Yes	Yes
<i>Sphcodes longuloides</i>	DD		DD		No	No
<i>Sphcodes longulus</i>	LC		LC		No	No
<i>Sphcodes majalis</i>	NT		NT		No	No
<i>Sphcodes marginatus</i>	LC		LC		No	No
<i>Sphcodes miniatus</i>	LC		LC		No	No
<i>Sphcodes monilicornis</i>	LC		LC		No	No
<i>Sphcodes niger</i>	LC		LC		No	No
<i>Sphcodes nomioidis</i>	LC		LC		No	No
<i>Sphcodes olivieri</i>	DD		DD		No	No
<i>Sphcodes pellucidus</i>	LC		LC		No	No
<i>Sphcodes piceohirtus</i>	DD		DD		Yes	Yes
<i>Sphcodes pinguiculus</i>	NT		NT		No	No
<i>Sphcodes pseudocrassus</i>	DD		DD		Yes	Yes
<i>Sphcodes pseudofasciatus</i>	DD		DD		No	No
<i>Sphcodes puncticeps</i>	LC		LC		No	No
<i>Sphcodes reticulatus</i>	LC		LC		No	No
<i>Sphcodes rubicundus</i>	NT		NT		No	No
<i>Sphcodes rubripes</i>	DD		DD		Yes	Yes
<i>Sphcodes ruficrus</i>	LC		LC		No	No
<i>Sphcodes rufiventris</i>	LC		LC		No	No
<i>Sphcodes scabricollis</i>	DD		DD		No	No
<i>Sphcodes schenckii</i>	NT		NT		No	No
<i>Sphcodes spinulosus</i>	NT		NT		No	No
<i>Sphcodes zangherii</i>	DD		DD		No	No
<i>Systropha curvicornis</i>	NT		NT		No	No

Taxonomy	IUCN Red List Category (Europe)	IUCN Red List Criteria (Europe)	IUCN Red List Category (EU 27)	IUCN Red List Criteria (EU 27)	Endemic to Europe	Endemic to EU 27
<i>Systropha planidens</i>	VU	B2ab(v)	VU	B2ab(v)	No	No
<i>Thrincohalictus prognathus</i>	NA		NA		No	No
MEGACHILIDAE						
<i>Afranthidium carduele</i>	DD		DD		No	No
<i>Afranthidium malacopygum</i>	DD		DD		No	No
<i>Afranthidium schulthessii</i>	NT		NT		No	No
<i>Aglaopis tridentata</i>	LC		LC		No	No
<i>Anthidiellum breviusculum</i>	LC		LC		No	No
<i>Anthidiellum strigatum</i>	LC		LC		No	No
<i>Anthidium cingulatum</i>	LC		LC		No	No
<i>Anthidium dalmaticum</i>	NT		NT		No	No
<i>Anthidium diadema</i>	DD		DD		No	No
<i>Anthidium florentinum</i>	LC		LC		No	No
<i>Anthidium loti</i>	DD		DD		No	No
<i>Anthidium manicatum</i>	LC		LC		No	No
<i>Anthidium montanum</i>	NT		NT		No	No
<i>Anthidium oblongatum</i>	LC		LC		No	No
<i>Anthidium punctatum</i>	LC		LC		No	No
<i>Anthidium septemspiniosum</i>	DD		DD		No	No
<i>Anthidium spiniventre</i>	NT		NT		No	No
<i>Anthidium taeniatum</i>	DD		DD		No	No
<i>Anthidium undulatifforme</i>	NT		NT		No	No
<i>Anthidium undulatum</i>	LC		LC		No	No
<i>Anthidium wuestneii</i>	DD		DD		No	No
<i>Chelostoma aegaicum</i>	DD		DD		No	No
<i>Chelostoma campanularum</i>	LC		LC		No	No
<i>Chelostoma diodon</i>	DD		DD		No	No
<i>Chelostoma distinctum</i>	LC		LC		No	No
<i>Chelostoma edentulum</i>	DD		DD		No	No
<i>Chelostoma emarginatum</i>	LC		LC		No	No
<i>Chelostoma florisonne</i>	LC		LC		No	No
<i>Chelostoma forcipatum</i>	DD		DD		No	No
<i>Chelostoma foveolatum</i>	LC		LC		No	No
<i>Chelostoma grande</i>	DD		DD		Yes	No
<i>Chelostoma handlirschi</i>	DD		DD		No	No
<i>Chelostoma hellenicum</i>	DD		DD		Yes	Yes
<i>Chelostoma incognitum</i>	DD		DD		No	No
<i>Chelostoma laticaudum</i>	DD		DD		Yes	Yes
<i>Chelostoma longifacies</i>	DD		DD		No	No
<i>Chelostoma lucens</i>	LC		LC		No	No
<i>Chelostoma mocsaryi</i>	LC		LC		No	No
<i>Chelostoma nasutum</i>	LC		LC		No	No
<i>Chelostoma proximum</i>	LC		NE		No	No
<i>Chelostoma rapunculi</i>	LC		LC		No	No
<i>Chelostoma siciliae</i>	DD		DD		Yes	Yes
<i>Chelostoma styriacum</i>	LC		LC		No	No
<i>Chelostoma transversum</i>	DD		DD		No	No
<i>Chelostoma ventrale</i>	LC		LC		No	No
<i>Coelioxys acanthopyga</i>	DD		DD		No	No
<i>Coelioxys acanthura</i>	LC		LC		No	No
<i>Coelioxys afra</i>	LC		LC		No	No
<i>Coelioxys alata</i>	LC		LC		No	No
<i>Coelioxys argentea</i>	LC		LC		No	No
<i>Coelioxys artemis</i>	DD		DD		No	No
<i>Coelioxys aurolimbata</i>	LC		LC		No	No
<i>Coelioxys brevis</i>	LC		LC		No	No

Taxonomy	IUCN Red List Category (Europe)	IUCN Red List Criteria (Europe)	IUCN Red List Category (EU 27)	IUCN Red List Criteria (EU 27)	Endemic to Europe	Endemic to EU 27
<i>Coelioxys caudata</i>	DD		DD		No	No
<i>Coelioxys conoidea</i>	LC		LC		No	No
<i>Coelioxys coturnix</i>	LC		LC		No	No
<i>Coelioxys decipiens</i>	LC		LC		No	No
<i>Coelioxys echinata</i>	LC		LC		No	No
<i>Coelioxys elegantula</i>	LC		LC		No	No
<i>Coelioxys elongata</i>	LC		LC		No	No
<i>Coelioxys elongatula</i>	VU	B2ab(iii)	VU	B2ab(iii)	No	No
<i>Coelioxys elsei</i>	DD		DD		No	No
<i>Coelioxys emarginata</i>	LC		LC		No	No
<i>Coelioxys haemorrhoea</i>	LC		LC		No	No
<i>Coelioxys inermis</i>	LC		LC		No	No
<i>Coelioxys lanceolata</i>	LC		LC		No	No
<i>Coelioxys mandibularis</i>	LC		LC		No	No
<i>Coelioxys obtusa</i>	LC		LC		No	No
<i>Coelioxys obtusispina</i>	DD		DD		No	No
<i>Coelioxys osmiae</i>	DD		DD		No	No
<i>Coelioxys polycentris</i>	LC		LC		No	No
<i>Coelioxys quadridentata</i>	LC		LC		No	No
<i>Coelioxys rufescens</i>	LC		LC		No	No
<i>Dioxys ardens</i>	DD		DD		No	No
<i>Dioxys atlantica</i>	DD		DD		Yes	Yes
<i>Dioxys cincta</i>	LC		LC		No	No
<i>Dioxys lanzarotensis</i>	DD		DD		Yes	Yes
<i>Dioxys moesta</i>	DD		DD		No	No
<i>Dioxys pumila</i>	DD		DD		No	No
<i>Ensliniana bidentata</i>	DD		DD		No	No
<i>Eoanthidium clypeare</i>	DD		DD		No	No
<i>Eoanthidium insulare</i>	LC		LC		No	No
<i>Haetosmia circumventa</i>	DD		DD		No	No
<i>Haetosmia vechti</i>	DD		DD		No	No
<i>Heriades clavicornis</i>	DD		DD		No	No
<i>Heriades crenulata</i>	LC		LC		No	No
<i>Heriades labiata</i>	DD		DD		No	No
<i>Heriades punctulifera</i>	DD		DD		No	No
<i>Heriades rubicola</i>	LC		LC		No	No
<i>Heriades truncorum</i>	LC		LC		No	No
<i>Hofferia schmiedeknechti</i>	LC		LC		No	No
<i>Hoplitis abnormis</i>	DD		DD		No	No
<i>Hoplitis acuticornis</i>	LC		LC		No	No
<i>Hoplitis adunca</i>	LC		LC		No	No
<i>Hoplitis agis</i>	DD		DD		No	No
<i>Hoplitis albaterra</i>	DD		DD		Yes	Yes
<i>Hoplitis albiscopa</i>	DD		DD		No	No
<i>Hoplitis anipuncta</i>	DD		DD		No	No
<i>Hoplitis annulata</i>	LC		LC		No	No
<i>Hoplitis anthocopoides</i>	LC		LC		No	No
<i>Hoplitis antigae</i>	DD		DD		No	No
<i>Hoplitis batyamae</i>	DD		DD		No	No
<i>Hoplitis benoisti</i>	LC		LC		No	No
<i>Hoplitis bicallosa</i>	DD		DD		No	No
<i>Hoplitis bihamata</i>	DD		DD		No	No
<i>Hoplitis bispinosa</i>	DD		DD		No	No
<i>Hoplitis bisulca</i>	LC		LC		No	No
<i>Hoplitis brachypogon</i>	LC		LC		No	No
<i>Hoplitis cadiza</i>	DD		DD		No	No

Taxonomy	IUCN Red List Category (Europe)	IUCN Red List Criteria (Europe)	IUCN Red List Category (EU 27)	IUCN Red List Criteria (EU 27)	Endemic to Europe	Endemic to EU 27
<i>Hoplitis campanularis</i>	LC		LC		No	No
<i>Hoplitis carinata</i>	LC		LC		No	No
<i>Hoplitis caularis</i>	DD		NE		No	No
<i>Hoplitis ciliaris</i>	LC		LC		No	No
<i>Hoplitis claviventris</i>	LC		LC		No	No
<i>Hoplitis cretaea</i>	DD		DD		Yes	Yes
<i>Hoplitis cristatula</i>	LC		LC		No	No
<i>Hoplitis curtula</i>	DD		DD		No	No
<i>Hoplitis curvipes</i>	LC		LC		No	No
<i>Hoplitis cypriaca</i>	DD		DD		No	No
<i>Hoplitis dalmatica</i>	LC		LC		No	No
<i>Hoplitis fabrei</i>	DD		DD		Yes	Yes
<i>Hoplitis fasciculata</i>	DD		DD		No	No
<i>Hoplitis fertoni</i>	DD		DD		No	No
<i>Hoplitis fulva</i>	LC		LC		No	No
<i>Hoplitis furcula</i>	DD		DD		No	No
<i>Hoplitis galbula</i>	DD		DD		No	No
<i>Hoplitis graeca</i>	DD		DD		Yes	Yes
<i>Hoplitis grandiscapa</i>	DD		DD		No	No
<i>Hoplitis grossepunctata</i>	DD		DD		No	No
<i>Hoplitis grumi</i>	DD		DD		No	No
<i>Hoplitis haemi</i>	DD		DD		No	No
<i>Hoplitis hilbera</i>	DD		DD		Yes	Yes
<i>Hoplitis holmboei</i>	DD		DD		Yes	Yes
<i>Hoplitis idaensis</i>	DD		DD		No	No
<i>Hoplitis illyrica</i>	LC		LC		No	No
<i>Hoplitis insularis</i>	DD		DD		No	No
<i>Hoplitis jakovlevi</i>	LC		LC		No	No
<i>Hoplitis jberingii</i>	LC		LC		No	No
<i>Hoplitis laboriosa</i>	DD		NE		No	No
<i>Hoplitis laevifrons</i>	LC		LC		No	No
<i>Hoplitis lepeletieri</i>	LC		LC		Yes	No
<i>Hoplitis leucomelana</i>	LC		LC		No	No
<i>Hoplitis limassolica</i>	DD		DD		No	No
<i>Hoplitis lithodorae</i>	DD		DD		Yes	Yes
<i>Hoplitis loti</i>	LC		LC		Yes	No
<i>Hoplitis lyscholmi</i>	DD		DD		No	No
<i>Hoplitis manicata</i>	LC		LC		No	No
<i>Hoplitis manuelae</i>	DD		DD		Yes	Yes
<i>Hoplitis marchali</i>	LC		LC		No	No
<i>Hoplitis maritima</i>	DD		NE		No	No
<i>Hoplitis mazzucchi</i>	LC		LC		No	No
<i>Hoplitis mitis</i>	LC		LC		No	No
<i>Hoplitis mocsaryi</i>	LC		LC		No	No
<i>Hoplitis mollis</i>	DD		DD		No	No
<i>Hoplitis monticola</i>	DD		DD		No	No
<i>Hoplitis moricei</i>	DD		DD		No	No
<i>Hoplitis mucida</i>	LC		LC		No	No
<i>Hoplitis nicolaei</i>	DD		DD		No	No
<i>Hoplitis nitidula</i>	LC		NE		No	No
<i>Hoplitis obtusa</i>	DD		DD		No	No
<i>Hoplitis occidentalis</i>	DD		DD		No	No
<i>Hoplitis ochraceicornis</i>	LC		LC		Yes	No
<i>Hoplitis pallicornis</i>	LC		LC		No	No
<i>Hoplitis papaveris</i>	LC		LC		No	No
<i>Hoplitis parnesica</i>	DD		DD		Yes	Yes

Taxonomy	IUCN Red List Category (IUCN)	IUCN Red List Criteria (Europe)	IUCN Red List Category (EU 27)	IUCN Red List Criteria (EU 27)	Endemic to Europe	Endemic to EU 27
<i>Hoplitis peniculifera</i>	DD		DD		Yes	Yes
<i>Hoplitis perezi</i>	LC		LC		No	No
<i>Hoplitis pici</i>	LC		LC		No	No
<i>Hoplitis pomarina</i>	DD		DD		No	No
<i>Hoplitis praestans</i>	LC		LC		No	No
<i>Hoplitis princeps</i>	DD		DD		No	No
<i>Hoplitis pulchella</i>	DD		DD		No	No
<i>Hoplitis quinquespinoza</i>	LC		LC		No	No
<i>Hoplitis ravouxi</i>	LC		LC		Yes	No
<i>Hoplitis robusta</i>	LC		LC		No	No
<i>Hoplitis saundersi</i>	LC		LC		No	No
<i>Hoplitis saxialis</i>	DD		DD		No	No
<i>Hoplitis serainae</i>	DD		DD		No	No
<i>Hoplitis stellaris</i>	DD		DD		No	No
<i>Hoplitis strymonia</i>	DD		DD		No	No
<i>Hoplitis subbutea</i>	DD		DD		No	No
<i>Hoplitis submanicata</i>	DD		DD		No	No
<i>Hoplitis tenuispina</i>	DD		DD		Yes	Yes
<i>Hoplitis tigrina</i>	DD		DD		No	No
<i>Hoplitis tkalcuella</i>	DD		DD		Yes	Yes
<i>Hoplitis tridentata</i>	LC		LC		No	No
<i>Hoplitis tuberculata</i>	LC		LC		No	No
<i>Hoplitis villosa</i>	LC		LC		Yes	No
<i>Hoplitis yermasoyiae</i>	LC		LC		No	No
<i>Hoplitis zaianorum</i>	DD		DD		No	No
<i>Hoplitis zandeni</i>	DD		DD		Yes	Yes
<i>Icteranthisdium cimbiciforme</i>	EN	B2ab(i,ii)	EN	B2ab(i,ii)	No	No
<i>Icteranthisdium ferrugineum</i>	DD		DD		No	No
<i>Icteranthisdium grohmanni</i>	LC		LC		No	No
<i>Icteranthisdium laterale</i>	LC		LC		No	No
<i>Icteranthisdium ovasi</i>	NT		NT		No	No
<i>Lithurgus chrysurus</i>	LC		LC		No	No
<i>Lithurgus cornutus</i>	LC		LC		No	No
<i>Lithurgus tibialis</i>	LC		LC		No	No
<i>Megachile albisepta</i>	DD		DD		No	No
<i>Megachile albocristata</i>	LC		LC		No	No
<i>Megachile albobirta</i>	DD		DD		No	No
<i>Megachile albonotata</i>	DD		DD		No	No
<i>Megachile alpicola</i>	DD		DD		Yes	No
<i>Megachile analis</i>	DD		DD		No	No
<i>Megachile apennina</i>	DD		DD		Yes	Yes
<i>Megachile apicalis</i>	LC		LC		No	No
<i>Megachile atlantica</i>	DD		DD		No	No
<i>Megachile baetica</i>	DD		DD		Yes	Yes
<i>Megachile basilaris</i>	DD		DD		No	No
<i>Megachile benoisti</i>	DD		DD		Yes	Yes
<i>Megachile binominata</i>	DD		DD		Yes	Yes
<i>Megachile bioculata</i>	DD		DD		Yes	Yes
<i>Megachile bombycina</i>	DD		DD		No	No
<i>Megachile breviceps</i>	DD		DD		Yes	Yes
<i>Megachile burdigalensis</i>	DD		DD		No	No
<i>Megachile canariensis</i>	DD		DD		Yes	Yes
<i>Megachile canescens</i>	DD		DD		Yes	Yes
<i>Megachile centuncularis</i>	LC		LC		No	No
<i>Megachile circumcincta</i>	LC		LC		No	No
<i>Megachile concinna</i>	DD		DD		No	No

Taxonomy	IUCN Red List Category (Europe)	IUCN Red List Criteria (Europe)	IUCN Red List Category (EU 27)	IUCN Red List Criteria (EU 27)	Endemic to Europe	Endemic to EU 27
<i>Megachile cressa</i>	DD		DD		Yes	Yes
<i>Megachile cypricola</i>	CR	D	CR	D	No	No
<i>Megachile dacica</i>	DD		DD		Yes	Yes
<i>Megachile deceptoria</i>	DD		DD		No	No
<i>Megachile diabolica</i>	NT		NT		No	No
<i>Megachile ericetorum</i>	LC		LC		No	No
<i>Megachile farinosa</i>	DD		DD		No	No
<i>Megachile fertoni</i>	DD		DD		No	No
<i>Megachile flabellipes</i>	DD		DD		No	No
<i>Megachile foersteri</i>	DD		DD		No	No
<i>Megachile fuerteventurae</i>	DD		DD		Yes	Yes
<i>Megachile fulvimana</i>	DD		DD		No	No
<i>Megachile genalis</i>	DD		DD		No	No
<i>Megachile ghilianii</i>	DD		DD		Yes	Yes
<i>Megachile giraudi</i>	DD		DD		Yes	No
<i>Megachile gothalauniensis</i>	DD		DD		Yes	Yes
<i>Megachile hohmanni</i>	DD		DD		Yes	Yes
<i>Megachile hungarica</i>	DD		DD		No	No
<i>Megachile lagopoda</i>	LC		LC		Yes	No
<i>Megachile lanigera</i>	DD		DD		No	No
<i>Megachile lapponica</i>	DD		DD		No	No
<i>Megachile leachella</i>	LC		LC		No	No
<i>Megachile lefebvrei</i>	DD		DD		No	No
<i>Megachile leucomalla</i>	DD		DD		No	No
<i>Megachile ligniseca</i>	DD		DD		No	No
<i>Megachile lucidifrons</i>	DD		DD		Yes	Yes
<i>Megachile maackii</i>	DD		DD		No	No
<i>Megachile manicata</i>	DD		DD		No	No
<i>Megachile maritima</i>	DD		DD		No	No
<i>Megachile mavromoustakisi</i>	DD		DD		Yes	Yes
<i>Megachile melanogaster</i>	DD		DD		No	No
<i>Megachile melanopyga</i>	LC		LC		No	No
<i>Megachile montenegrensis</i>	DD		DD		No	No
<i>Megachile nigriventris</i>	DD		DD		No	No
<i>Megachile octosignata</i>	DD		DD		No	No
<i>Megachile opacifrons</i>	DD		DD		Yes	Yes
<i>Megachile parietina</i>	LC		LC		Yes	No
<i>Megachile picicornis</i>	DD		DD		No	No
<i>Megachile pilicrus</i>	DD		DD		No	No
<i>Megachile pilidens</i>	LC		LC		No	No
<i>Megachile pugillatoria</i>	DD		DD		Yes	Yes
<i>Megachile punctatissima</i>	DD		DD		Yes	Yes
<i>Megachile pusilla</i>	DD		DD		Yes	Yes
<i>Megachile pyrenaee</i>	DD		DD		No	No
<i>Megachile pyrenaica</i>	DD		DD		No	No
<i>Megachile rhodosiaca</i>	DD		DD		Yes	Yes
<i>Megachile roeweri</i>	DD		DD		Yes	Yes
<i>Megachile rotundata</i>	DD		DD		No	No
<i>Megachile rufescens</i>	DD		DD		Yes	Yes
<i>Megachile rufitarsis</i>	NA		NA		No	No
<i>Megachile schmiedeknechti</i>	DD		DD		No	No
<i>Megachile semicircularis</i>	DD		DD		Yes	Yes
<i>Megachile semipleata</i>	DD		DD		Yes	Yes
<i>Megachile sexmaculata</i>	DD		DD		No	No
<i>Megachile sicula</i>	DD		DD		No	No
<i>Megachile troodica</i>	DD		DD		Yes	Yes

Taxonomy	IUCN Red List Category (Europe)	IUCN Red List Criteria (Europe)	IUCN Red List Category (EU 27)	IUCN Red List Criteria (EU 27)	Endemic to Europe	Endemic to EU 27
<i>Megachile versicolor</i>	DD		DD		No	No
<i>Megachile walkeri</i>	DD		DD		No	No
<i>Megachile willughbiella</i>	LC		LC		No	No
<i>Metadioxys graeca</i>	DD		DD		No	No
<i>Osmia aeruginosa</i>	DD		DD		No	No
<i>Osmia alfkenii</i>	DD		DD		No	No
<i>Osmia alticola</i>	LC		LC		Yes	No
<i>Osmia amathusica</i>	DD		DD		No	No
<i>Osmia anceyi</i>	LC		LC		No	No
<i>Osmia andrenoides</i>	LC		LC		No	No
<i>Osmia apicata</i>	LC		LC		No	No
<i>Osmia argyropyga</i>	LC		LC		No	No
<i>Osmia ariadne</i>	DD		DD		Yes	Yes
<i>Osmia aurulenta</i>	LC		LC		No	No
<i>Osmia balearica</i>	DD		DD		Yes	Yes
<i>Osmia bicolor</i>	LC		LC		No	No
<i>Osmia bicornis</i>	LC		LC		No	No
<i>Osmia bidentata</i>	LC		LC		No	No
<i>Osmia bischoffi</i>	LC		LC		No	No
<i>Osmia breviata</i>	DD		DD		No	No
<i>Osmia brevicornis</i>	LC		LC		No	No
<i>Osmia caerulea</i>	LC		LC		No	No
<i>Osmia cephalotes</i>	LC		LC		No	No
<i>Osmia cerinthidis</i>	LC		LC		No	No
<i>Osmia cinctella</i>	DD		DD		No	No
<i>Osmia cinnabarina</i>	DD		DD		No	No
<i>Osmia chlypearis</i>	LC		LC		No	No
<i>Osmia corniculata</i>	DD		DD		No	No
<i>Osmia cornuta</i>	LC		LC		No	No
<i>Osmia croatica</i>	LC		LC		No	No
<i>Osmia cyanescens</i>	DD		NE		No	No
<i>Osmia cyanoxantha</i>	LC		LC		No	No
<i>Osmia dilaticornis</i>	DD		DD		No	No
<i>Osmia dimidiata</i>	LC		LC		No	No
<i>Osmia distinguenda</i>	LC		LC		No	No
<i>Osmia dives</i>	LC		LC		No	No
<i>Osmia dlabolae</i>	DD		DD		No	No
<i>Osmia dusmeti</i>	DD		DD		Yes	Yes
<i>Osmia elegans</i>	DD		DD		No	No
<i>Osmia emarginata</i>	LC		LC		No	No
<i>Osmia erythrogastra</i>	LC		LC		No	No
<i>Osmia fallax</i>	DD		DD		No	No
<i>Osmia ferruginea</i>	LC		LC		No	No
<i>Osmia forticornis</i>	DD		DD		No	No
<i>Osmia frieseana</i>	DD		DD		No	No
<i>Osmia gallarum</i>	LC		LC		No	No
<i>Osmia hellados</i>	DD		DD		No	No
<i>Osmia heteracantha</i>	LC		LC		No	No
<i>Osmia iberica</i>	DD		DD		Yes	Yes
<i>Osmia inermis</i>	LC		LC		No	No
<i>Osmia jason</i>	LC		LC		No	No
<i>Osmia kohli</i>	DD		DD		No	No
<i>Osmia labialis</i>	LC		LC		No	No
<i>Osmia larochei</i>	DD		DD		Yes	Yes
<i>Osmia laticauda</i>	DD		DD		No	No
<i>Osmia laticeps</i>	LC		LC		No	No

Taxonomy	IUCN Red List Category (Europe)	IUCN Red List Criteria (Europe)	IUCN Red List Category (EU 27)	IUCN Red List Criteria (EU 27)	Endemic to Europe	Endemic to EU 27
<i>Osmia latreillei</i>	LC		LC		No	No
<i>Osmia leaiana</i>	LC		LC		No	No
<i>Osmia ligurica</i>	LC		LC		No	No
<i>Osmia lobata</i>	DD		DD		No	No
<i>Osmia lunata</i>	LC		LC		No	No
<i>Osmia madeirensis</i>	DD		DD		Yes	Yes
<i>Osmia maritima</i>	EN	B2ab(ii,iii,v)	EN	B2ab(ii,iii,v)	No	No
<i>Osmia melanogaster</i>	LC		LC		No	No
<i>Osmia melanura</i>	LC		LC		No	No
<i>Osmia mirhiji</i>	DD		DD		Yes	Yes
<i>Osmia moreensis</i>	DD		DD		Yes	Yes
<i>Osmia mustelina</i>	LC		LC		No	No
<i>Osmia nana</i>	DD		DD		No	No
<i>Osmia nasoproducta</i>	DD		DD		No	No
<i>Osmia nasuta</i>	DD		DD		No	No
<i>Osmia nigriventris</i>	LC		LC		No	No
<i>Osmia nigrohirta</i>	DD		DD		No	No
<i>Osmia niveata</i>	LC		LC		No	No
<i>Osmia niveocincta</i>	DD		DD		No	No
<i>Osmia notata</i>	LC		LC		No	No
<i>Osmia olgae</i>	DD		DD		No	No
<i>Osmia padri</i>	DD		DD		No	No
<i>Osmia palmae</i>	DD		DD		Yes	Yes
<i>Osmia parietina</i>	LC		LC		No	No
<i>Osmia picena</i>	DD		DD		Yes	Yes
<i>Osmia pilicornis</i>	LC		LC		Yes	No
<i>Osmia pinguis</i>	LC		LC		No	No
<i>Osmia rhodoensis</i>	LC		LC		No	No
<i>Osmia rufohirta</i>	LC		LC		No	No
<i>Osmia rutila</i>	DD		DD		No	No
<i>Osmia saxicola</i>	LC		LC		No	No
<i>Osmia scutellaris</i>	LC		LC		No	No
<i>Osmia signata</i>	LC		LC		No	No
<i>Osmia spinigera</i>	DD		DD		No	No
<i>Osmia spinulosa</i>	LC		LC		No	No
<i>Osmia steinmanni</i>	DD		DD		Yes	No
<i>Osmia subcornuta</i>	LC		LC		No	No
<i>Osmia submicans</i>	LC		LC		No	No
<i>Osmia svenssoni</i>	DD		DD		Yes	Yes
<i>Osmia sybarita</i>	LC		LC		No	No
<i>Osmia tergestensis</i>	LC		LC		No	No
<i>Osmia teunissenii</i>	DD		DD		No	No
<i>Osmia tricornis</i>	LC		LC		No	No
<i>Osmia tunensis</i>	LC		LC		No	No
<i>Osmia unicoloris</i>	LC		LC		No	No
<i>Osmia uncinata</i>	LC		LC		No	No
<i>Osmia versicolor</i>	LC		LC		No	No
<i>Osmia viridana</i>	LC		LC		No	No
<i>Osmia xanthomelana</i>	LC		LC		No	No
<i>Paradioxys pannonica</i>	DD		DD		No	No
<i>Protosmia asensioi</i>	DD		DD		Yes	Yes
<i>Protosmia capitata</i>	DD		DD		Yes	Yes
<i>Protosmia exenterata</i>	LC		LC		No	No
<i>Protosmia glutinosa</i>	LC		LC		No	No
<i>Protosmia longiceps</i>	DD		DD		No	No
<i>Protosmia minutula</i>	DD		DD		Yes	No

Taxonomy	IUCN Red List Category (Europe)	IUCN Red List Criteria (Europe)	IUCN Red List Category (EU 27)	IUCN Red List Criteria (EU 27)	Endemic to Europe	Endemic to EU 27
<i>Protosmia monstrosa</i>	DD		DD		No	No
<i>Protosmia montana</i>	DD		DD		No	No
<i>Protosmia paradoxa</i>	DD		DD		No	No
<i>Protosmia sideritis</i>	DD		DD		No	No
<i>Protosmia stigmatica</i>	DD		DD		No	No
<i>Protosmia tauricola</i>	LC		LC		No	No
<i>Protosmia tiflensis</i>	LC		LC		No	No
<i>Pseudoanthidium alpinum</i>	DD		DD		No	No
<i>Pseudoanthidium canariense</i>	DD		DD		Yes	Yes
<i>Pseudoanthidium cribratum</i>	DD		DD		No	No
<i>Pseudoanthidium eximium</i>	NT		NT		No	No
<i>Pseudoanthidium melanurum</i>	LC		LC		No	No
<i>Pseudoanthidium nanum</i>	LC		LC		No	No
<i>Pseudoanthidium reticulatum</i>	DD		DD		No	No
<i>Pseudoanthidium scapulare</i>	DD		DD		No	No
<i>Pseudoanthidium tenellum</i>	DD		DD		No	No
<i>Rhodanthidium acuminatum</i>	NT		NT		No	No
<i>Rhodanthidium caturigense</i>	DD		DD		No	No
<i>Rhodanthidium ducale</i>	DD		DD		No	No
<i>Rhodanthidium infuscatum</i>	DD		DD		No	No
<i>Rhodanthidium septemdentatum</i>	DD		DD		No	No
<i>Rhodanthidium siculum</i>	DD		DD		No	No
<i>Rhodanthidium sticticum</i>	DD		DD		No	No
<i>Stelis aegyptiaca</i>	DD		DD		No	No
<i>Stelis annulata</i>	DD		DD		No	No
<i>Stelis breviscula</i>	LC		LC		No	No
<i>Stelis franconica</i>	DD		DD		Yes	No
<i>Stelis gigantea</i>	DD		DD		No	No
<i>Stelis hispanica</i>	DD		DD		No	No
<i>Stelis iugae</i>	DD		DD		No	No
<i>Stelis minima</i>	LC		LC		No	No
<i>Stelis minuta</i>	LC		LC		No	No
<i>Stelis nasuta</i>	LC		LC		No	No
<i>Stelis odontopyga</i>	LC		LC		No	No
<i>Stelis orientalis</i>	DD		DD		No	No
<i>Stelis ornatula</i>	LC		LC		No	No
<i>Stelis ortizi</i>	DD		DD		Yes	Yes
<i>Stelis pentelica</i>	DD		DD		No	No
<i>Stelis phaeoptera</i>	DD		DD		No	No
<i>Stelis punctulatissima</i>	LC		LC		No	No
<i>Stelis rhodia</i>	DD		DD		No	No
<i>Stelis ruficornis</i>	DD		DD		No	No
<i>Stelis scutellaris</i>	DD		DD		No	No
<i>Stelis signata</i>	LC		LC		No	No
<i>Stelis simillima</i>	LC		LC		No	No
<i>Stenoheriades asiaticus</i>	DD		DD		No	No
<i>Stenoheriades hofferi</i>	DD		DD		No	No
<i>Trachusa byssina</i>	LC		LC		No	No
<i>Trachusa dumerlei</i>	LC		LC		No	No
<i>Trachusa interrupta</i>	EN	B2ab(v)	EN	B2ab(v)	No	No
<i>Trachusa laeiventris</i>	DD		DD		No	No
<i>Trachusa laticeps</i>	NT		NT		No	No

Taxonomy	IUCN Red List Category (Europe)	IUCN Red List Criteria (Europe)	IUCN Red List Category (EU 27)	IUCN Red List Criteria (EU 27)	Endemic to Europe	Endemic to EU 27
<i>Trachusa pubescens</i>	DD		DD		No	No
MELITTIDAE						
<i>Dasygaster albimana</i>	NT		NT		No	No
<i>Dasygaster argentata</i>	NT		NT		No	No
<i>Dasygaster braccata</i>	EN	B2ab(iii,v)	EN	B2ab(iii,v)	No	No
<i>Dasygaster cingulata</i>	LC		LC		No	No
<i>Dasygaster crassicornis</i>	LC		LC		No	No
<i>Dasygaster dusmeti</i>	LC		LC		No	No
<i>Dasygaster frieseana</i>	EN	B2ab(iii)	EN	B2ab(iii)	Yes	No
<i>Dasygaster hirtipes</i>	LC		LC		No	No
<i>Dasygaster iberica</i>	DD		DD		Yes	Yes
<i>Dasygaster morotei</i>	LC		LC		Yes	Yes
<i>Dasygaster pyriformis</i>	LC		LC		Yes	No
<i>Dasygaster pyrotrichia</i>	LC		LC		No	No
<i>Dasygaster sinuata</i>	DD		DD		No	No
<i>Dasygaster spinigera</i>	EN	B2ab(iii)	EN	B2ab(iii)	No	No
<i>Dasygaster suripes</i>	EN	B2ab(iii,iv,v)	EN	B2ab(iii,iv,v)	No	No
<i>Dasygaster visnaga</i>	LC		LC		No	No
<i>Macropis europaea</i>	LC		LC		Yes	No
<i>Macropis frivaldszkyi</i>	NT		NT		No	No
<i>Macropis fulvipes</i>	LC		LC		No	No
<i>Melitta aegyptiaca</i>	DD		DD		No	No
<i>Melitta budashkini</i>	DD		DD		Yes	No
<i>Melitta budensis</i>	LC		DD		No	No
<i>Melitta dimidiata</i>	NT		NT		No	No
<i>Melitta haemorrhoidalis</i>	LC		LC		No	No
<i>Melitta hispanica</i>	VU	D2	VU	D2	Yes	Yes
<i>Melitta iberica</i>	DD		DD		Yes	Yes
<i>Melitta kastiliensis</i>	VU	D2	VU	D2	Yes	Yes
<i>Melitta leporina</i>	LC		LC		No	No
<i>Melitta maura</i>	DD		DD		No	No
<i>Melitta melanura</i>	EN	B2ab(ii,v)	EN	B2ab(ii,v)	No	No
<i>Melitta murciana</i>	DD		DD		Yes	Yes
<i>Melitta nigricans</i>	LC		LC		No	No
<i>Melitta schmiedeknechti</i>	DD		DD		No	No
<i>Melitta seitzii</i>	DD		DD		Yes	Yes
<i>Melitta tomentosa</i>	DD		DD		Yes	No
<i>Melitta tricincta</i>	NT		NT		No	No
<i>Melitta udmurtica</i>	DD		DD		Yes	No

Appendix 2. Example of species summary and distribution map

The species summary gives all the information collated (for each species) during this assessment, including a distribution map. You can search for and download all the summaries and distribution maps from the European Red List website and data portal available online at <http://ec.europa.eu/environment/nature/conservation/species/redlist/> and <http://www.iucnredlist.org/initiatives/europe>.



Colletes albomaculatus - (Lucas, 1849)

ANIMALIA - ARTHROPODA - INSECTA - HYMENOPTERA - COLLETIDAE - Colletes - albomaculatus

Common Names: No Common Names

Synonyms: *Colletes niveofasciatus* Dours, 1872; *Halictus albomaculatus* Lucas, 1849

Red List Status

NT, (IUCN version 3.1)

Red List Assessment

Assessment Information

Date of Assessment: 2013-07-11

Reviewed?	Date of Review:	Status:	Reasons for Rejection:	Improvements Needed:
true	2013-09-04	Passed	-	-

Assessor(s): Kuhlmann, M.

Reviewer(s): Miller, R.M., Nieto, A. & Roberts, S.

Regions: Europe

Assessment Rationale

European regional assessment: Near Threatened (NT)

EU 27 regional assessment: Near Threatened (NT)

Listed as Near Threatened because its area of occupancy (AOO) is small (620 km²), it is disappearing from the northern limits of its range and there is likely to be a decline in the habitat of the species due to anthropogenic pressure, thus making this species close to qualifying for a threatened category under Criterion B2.

Distribution

Geographic Range

Colletes albomaculatus is widely distributed in north Africa, southern and south-central Europe towards the Middle East and Central Asia (Ortiz-Sánchez *et al.* 2002, Kuhlmann 2005, Kuhlmann and Özbek 2007, Roberts *et al.* 2011, Proshchalykin and Kuhlmann 2012, Kuhlmann *et al.* 2012). The extent of occurrence (EOO) in Europe is 3,946,279 km² and in the EU 27 is 3,173,130 km². The area of occupancy (AOO) in Europe is 620 km² and in the EU 27 is 508 km².

Area of Occupancy (AOO)

Estimated area of occupancy (AOO) - in km2	Justification
620	-

Extent of Occurrence (EOO)

Estimated extent of occurrence (EOO)- in km2	Justification
3946279	-

Map Status

Map Status	Data Sensitive?	Justification	Geographic range this applies to:	Date restriction imposed:
Done	-	-	-	-

Biogeographic Realms

Biogeographic Realm: Palearctic

Occurrence

Countries of Occurrence

Country	Presence	Origin	Formerly Bred	Seasonality
Austria	Extant	Native	-	Resident
Bulgaria	Extant	Native	-	Resident
Croatia	Extant	Native	-	Resident
Czech Republic	Extinct Post-1500	Native	-	Resident
France	Extant	Native	-	Resident
France -> France (mainland)	Extant	Native	-	Resident
Greece	Extant	Native	-	Resident
Greece -> Greece (mainland)	Extant	Native	-	Resident
Greece -> Kriti	Extant	Native	-	Resident
Hungary	Extant	Native	-	Resident
Italy	Extant	Native	-	Resident
Italy -> Italy (mainland)	Extant	Native	-	Resident
Italy -> Sardegna	Extant	Native	-	Resident
Italy -> Sicilia	Extant	Native	-	Resident
Macedonia, the former Yugoslav Republic of	Extant	Native	-	Resident
Portugal	Extant	Native	-	Resident
Portugal -> Portugal (mainland)	Extant	Native	-	Resident
Romania	Extant	Native	-	Resident
Slovakia	Extant	Native	-	Resident
Slovenia	Extant	Native	-	Resident
Spain	Extant	Native	-	Resident
Spain -> Balears	Extant	Native	-	Resident
Spain -> Spain (mainland)	Extant	Native	-	Resident
Ukraine	Extant	Native	-	Resident
Ukraine -> Krym	Extant	Native	-	Resident
Ukraine -> Ukraine (main part)	Extant	Native	-	Resident

Population

Little is known about the populations of *Colletes albomaculatus* but it is likely to be in decline due to anthropogenic pressure on its habitats. At the northern limits of its range this species is disappearing for unknown reasons but change in habitat size and quality is a likely cause.

Population Information

Current Population Trend: Decreasing

Habitats and Ecology

The habitats used by *Colletes albomaculatus* are unknown but likely are open vegetation types (e.g., Mediterranean shrub lands, grasslands). The species is a flower visitor that preferably collects pollen on Resedaceae (it is polylectic, taking pollen from a wide variety of plants, but with strong preference for Resedaceae) (Müller and Kuhlmann 2008).

IUCN Habitats Classification Scheme

Habitat	Season	Suitability	Major Importance?
3.8. Shrubland -> Shrubland - Mediterranean-type Shrubby Vegetation	resident	Suitable	Yes
4.4. Grassland -> Grassland - Temperate	resident	Suitable	Yes

Systems

System: Terrestrial

Use and Trade

General Use and Trade Information

Species not utilized: true

This species is not utilized.

Threats

Likely threats are the anthropogenic loss (agriculture, habitat destruction, change in land use) of habitat (e.g. open vegetation types with bare soil), nesting sites and host plants.

Threats Classification Scheme

Threat	Timing	Scope	Severity	Impact Score
2.1.1. Agriculture & aquaculture -> Annual & perennial non-timber crops -> Shifting agriculture	Unknown	Unknown	Unknown	Unknown
2.3.4. Agriculture & aquaculture -> Livestock farming & ranching -> Scale Unknown/Unrecorded	Unknown	Unknown	Unknown	Unknown

Conservation

This species is included in the National Red List or Red Data Book of the Czech Republic (Regionally Extinct; Farkac *et al.* 2005) and Slovenia (Vulnerable; Anonymous 2002).

It is recommended to conserve suitable habitats (e.g. open vegetation types with bare soil), nesting sites and the host plants of this species.

Further research is required to establish the current status of the species throughout its range and to identify the existing threats.

It is not known if the species occurs in any protected area.

Conservation Actions In- Place

Occur in at least one PA	Note
Unknown	-

Important Conservation Actions Needed

Conservation Actions	Note
1.1. Land/water protection -> Site/area protection	-
1.2. Land/water protection -> Resource & habitat protection	-

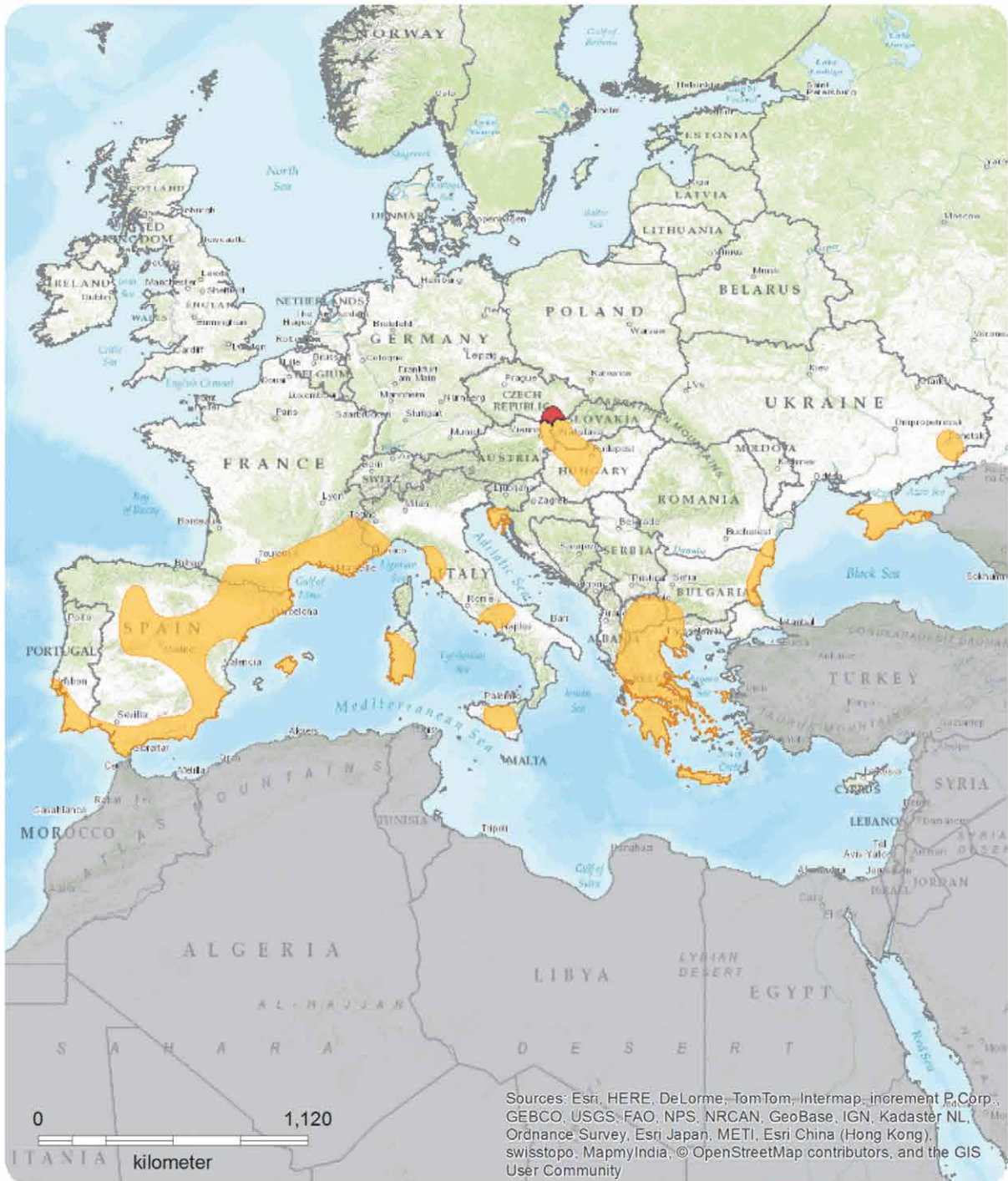
Research Needed

Research	Note
1.2. Research -> Population size, distribution & trends	-
1.3. Research -> Life history & ecology	-
1.5. Research -> Threats	-

Bibliography

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European Regional Assessment



Colletes albomaculatus



Range

- Extant (resident)
- Regionally Extinct

Compiled by:
European Red List, IUCN (2013)

Map created 12/17/2014



The boundaries and names shown and the designations used on this map do not imply any official endorsement, acceptance or opinion by IUCN.

IUCN Red List of Threatened Species™ – Regional Assessments

Europe

- *The Status and Distribution of European Mammals*. Compiled by Helen J. Temple and Andrew Terry, 2007
- *European Red List of Reptiles*. Compiled by Neil Cox and Helen J. Temple, 2009
- *European Red List of Amphibians*. Compiled by Helen J. Temple and Neil Cox, 2009
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The European Red List is a review of the conservation status of European species according to IUCN regional Red Listing guidelines. It identifies those species that are threatened with extinction at the regional level – in order that appropriate conservation action can be taken to improve their status.

This publication summarises results for all Europe's native species of bees (1,965 species). 9.2% of species are threatened with extinction at the European level due to habitat loss as a result of agriculture intensification (e.g., changes in agricultural practices including the use of pesticides and fertilisers), urban development, increased frequency of fires and climate change.

The European Red List was compiled by IUCN's Global Species Programme and the European Union Representative Office with support from the STEP project (www.STEP-project.onet) and it is the product of a service contract with the European Commission. It is available online at <http://ec.europa.eu/environment/nature/conservation/species/redlist> and <http://www.iucnredlist.org/initiatives/europe>