

EUROPEAN RED LISTS OF INVERTEBRATES

European Red List of Dragonflies

Compiled by Vincent J. Kalkman, Jean-Pierre Boudot, Rafal Bernard, Klaus-Jürgen Conze, Geert De Knijff, Elena Dyatlova, Sónia Ferreira, Miloš Jović, Jürgen Ott, Elisa Riservato and Göran Sahle



European Red List of Butterflies

Compiled by Chris van Swaay, Annabelle Cuttelod, Sue Collins, Dirk Maes, Miguel López Munguira, Martin Šašić, Josef Settele, Rudi Verovnik, Theo Verstraël, Martin Warren, Martin Wiemers and Irma Wynhoff



European Red List of Saproxylic Beetles

Compiled by Ana Nieto and Keith N.A. Alexander



What do butterflies, beetles and dragonflies have in common?

Butterflies, beetles and dragonflies play an important role in **contributing** to Europe's rich **biodiversity**.

Through **pollination**, **nutrient-cycling** and **pest control**, respectively, they help to maintain vital balances within the ecosystems upon which we all depend.



What do butterflies, beetles and dragonflies have in common?

Unfortunately, according to the IUCN Red List of Threatened Species™ - the world's most comprehensive information source on the global conservation status of animals and plants - all three taxonomic groups are considered to be **in decline** in Europe.

Furthermore, recent analyses found that 9% of Europe's butterflies, 11% of its saproxylic beetles and 14% of its dragonflies are **threatened with extinction**.



What do butterflies, beetles and dragonflies have in common?

There are 482 butterfly species in Europe, with the highest diversity being found in the mountainous areas of southern Europe, mainly the Pyrenees, the Alps and the Balkans.

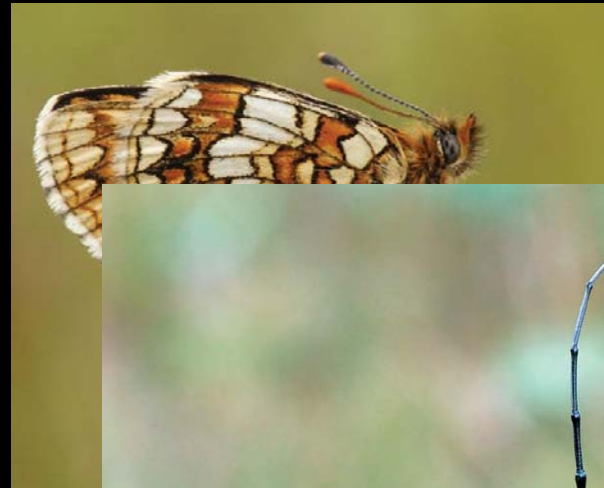
Butterflies go through three main stages of development – from caterpillar to chrysalis to adult – and have very different habitat requirements during each of these stages.



What do butterflies, beetles and dragonflies have in common?

Saproxylic beetles depend upon **decaying wood**, particularly in forests, for their survival.

These beetles play an important role in the **decomposition** and **nutrient-cycling** processes which occur in natural ecosystems, and many are also involved in **pollination**.



What do butterflies, beetles and dragonflies have in common?



Dragonflies are relatively large insects, recognized for their striking colours and equilibristic flight.

Most of them make their homes in **freshwater environments**, and thus serve as good indicators for environmental change both **above** and **below the water's surface**.



What is the main threat?

The main threat to all three groups of species is **habitat loss**, although **climate change** is set to become an increasing threat in the future.

Europe has the most fragmented landscapes of all the continents and only a tiny fraction of land can be considered wilderness.

While these species have adapted to thrive in semi-natural conditions created and maintained by human activity, these habitats are under **increasing pressure** from agriculture, urban sprawl, over-abstraction of water, unsustainable forest management, tourism, land abandonment, logging and forest fires.



What is the main threat?

Butterflies and dragonflies have a particularly high number of threatened species in southern Europe,

whilst beetles are most threatened in central and eastern Europe.



European Red List of Dragonflies

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Europe holds 138 species of dragonflies.

Eighteen of the European species are endemic to Europe.

Sixteen of the 18 endemics are either confined to islands, to the Balkan Peninsula or (at least mainly) to the Iberian Peninsula and France.



About a quarter (24%) of the European dragonflies have **declining populations**, ten percent are increasing and roughly **half of the species are stable**.

For the remaining 12%, the available **information is too limited** to define any population trends.

Dainty Bluet *Coenagrion scitulum* (Least Concern) (left) and the Azure hawkler *Aeshna caerulea* (Least Concern) (right). The two suborders of Odonata, damselflies and dragonflies, are easy to recognize. In damselflies the fore- and hindwing have the same shape, the eyes are widely separated and most species keep their wings shut when at rest. In dragonflies the hindwing is much broader than the forewing, the eyes touch each other in most species and the wings are spread out when at rest. Photos © Jean-Pierre Boudot.



Damselflies
ZYGOPTERA

true Dragonflies
ANISOPTERA

Blue hawker *Aeshna cyanea* (Least Concern) in flight. All dragonflies catch prey such as mosquitoes in flight. Photo © Jean-Pierre Boudot.



Approximately one out of seven (15%) European dragonflies are **threatened in Europe**.

Most of the threatened species are confined to parts of southern Europe.

Currently, the main threat to European dragonflies is **desiccation of their habitats** due to the increasingly hot and dry summers combined with intensified water extraction for drinking and irrigation.

Other important threats to species living in running waters are **water pollution** and the construction of **dams** and **reservoirs**.

Table 1. Diversity and endemism of European dragonflies. This table also includes the five species which were not assessed due to their marginal occurrence in Europe.

Order	Suborder	Family	Europe		EU 27	
			Number of species (number of species and subspecies)	Number of endemic (sub)species (% endemic)	Number of species (number of species and subspecies)	Number of endemic (sub)species (% endemic)
Odonata	Zygoptera	Calopterygidae	4	1 (25)	4	1 (25)
		Epallagidae	1	0	1	0
		Lestidae	9	0	9	0
		Coenagrionidae	30	3 (10)	28	2 (7)
		Platycnemididae	4	2 (50)	4	2 (50)
	Anisoptera	Aeshnidae	20	1 (5)	20	1 (5)
		Gomphidae	13 (15)	2 (13)	13 (15)	2 (13)
		Cordulegastridae	7 (9)	6 (66)	7 (9)	4 (44)
		Macromiidae	1	1 (100)	1	1 (100)
		Corduliidae	11	1 (9)	10	0
		Libellulidae	38	1 (3)	38	1 (3)
Total			138 (142)	18	135 (139)	14

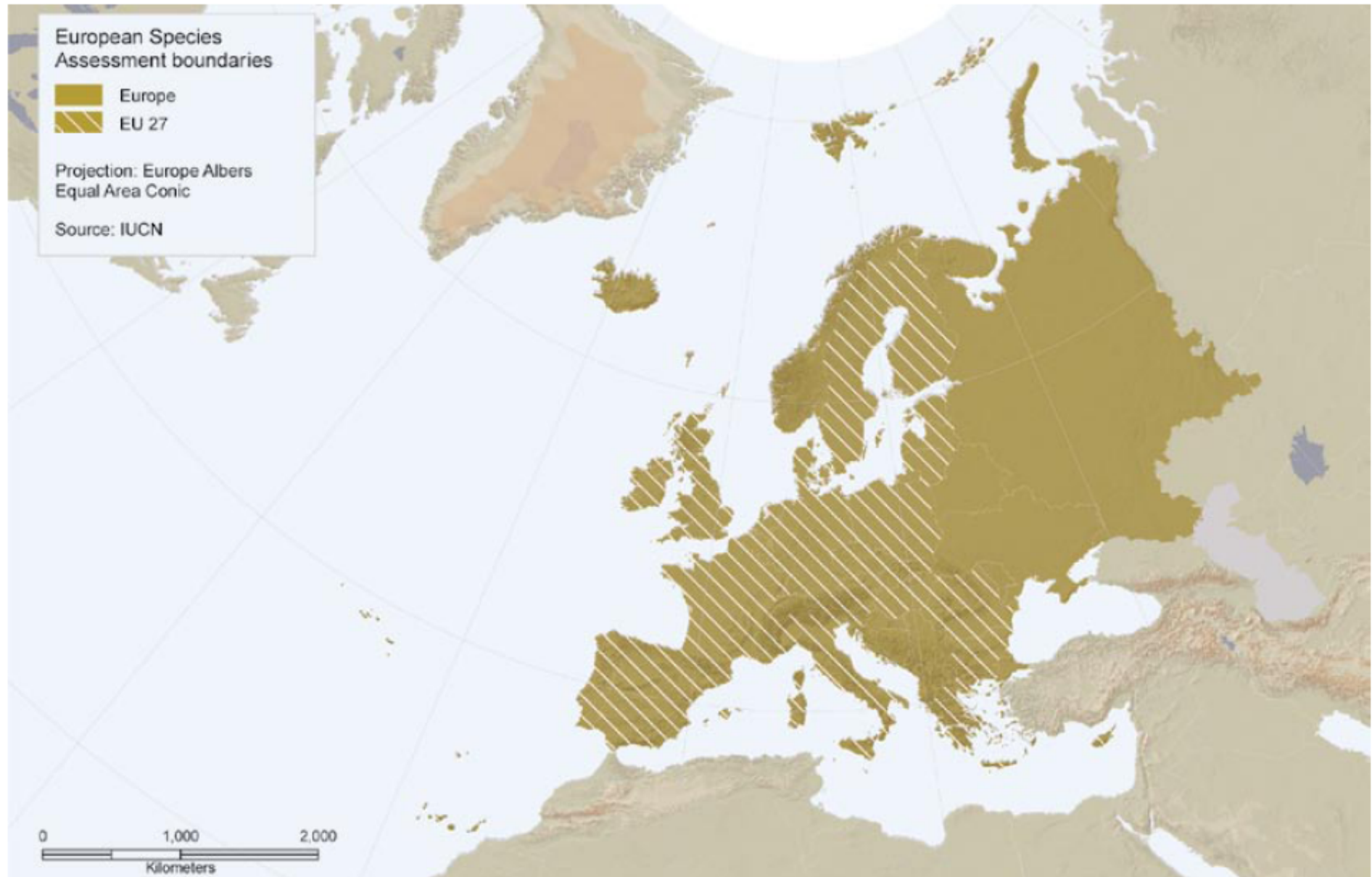


The Moustard Hawk
Achna juncea is common
and widespread in most of
northern and central Europe.
In the south of its range, it
might, however, decline due to
climate change. Photo © Jean-Pierre
Boudot

The European regional assessment has four main objectives:

- To contribute to regional conservation planning by providing a baseline dataset concerning the **status** of European dragonflies.
- To identify **geographic areas** and **habitats in need of conservation measures**, and to ensure that all European dragonflies reach and maintain a favourable conservation status.
- To identify the **major threats** and to propose measures to address them.
- To strengthen the network of experts focused on the conservation of dragonflies in Europe, so that the assessment **information can be kept updated**, and expertise can be targeted to address the highest **conservation priorities**.

Figure 2. Regional assessments were made for two areas – geographical Europe and the EU 27

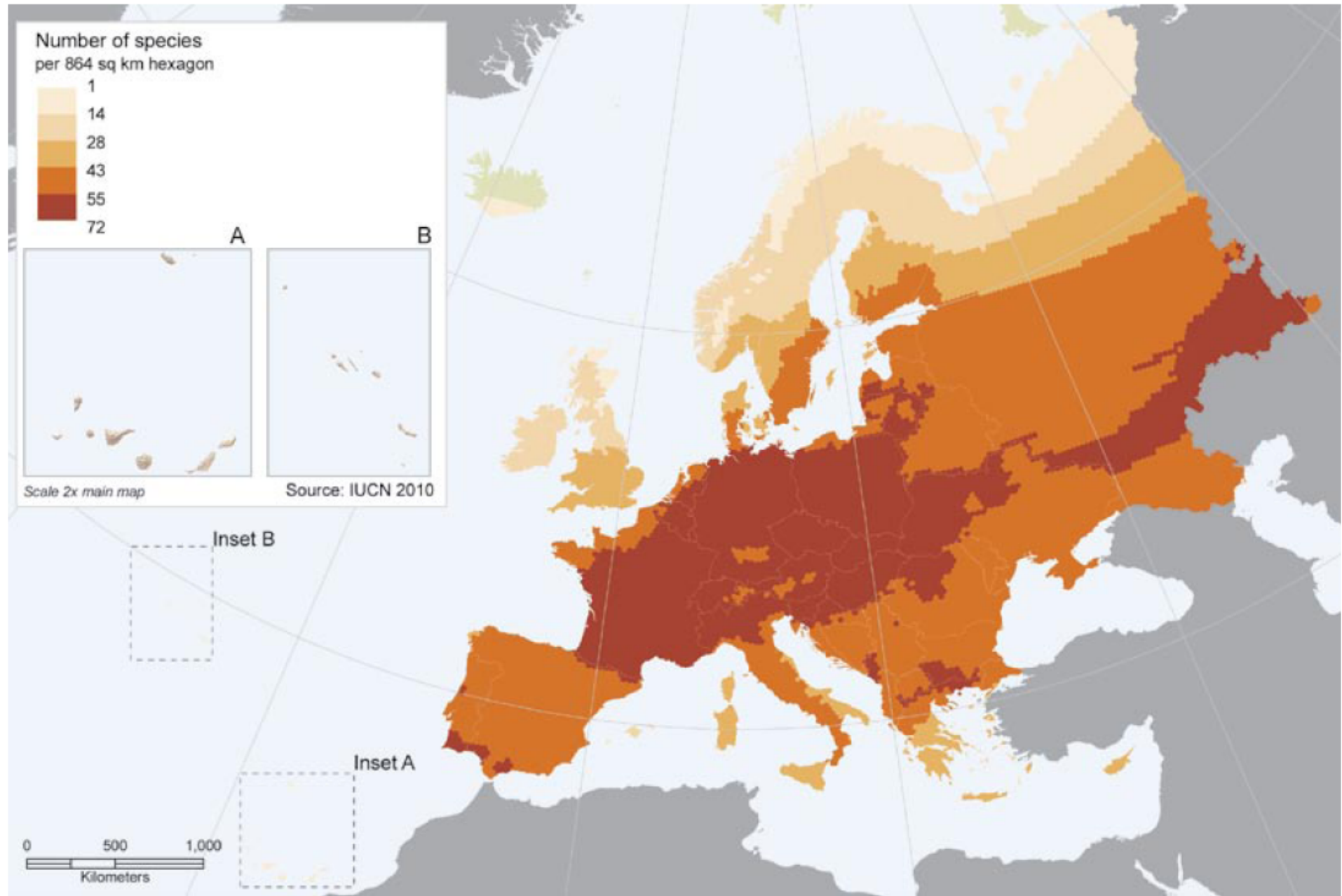




For each taxon the following data were entered into the Species Information Service (SIS) database:

- Taxonomic classification
- Geographic range
(including a distribution map)
- Red List Category and Criteria
- Population information
- Habitat preferences
- Major threats
- Conservation measures
- Other general information
- Key literature references

Figure 3. Species richness of European dragonflies



Country	Total number of species
Albania	53 (2)
Andorra	15
Austria	77
Belarus	63
Belgium	69
Bosnia Herzegovina	57 (1)
Bulgaria	67
Cyprus	36
Croatia	66
Czech Republic	71 (2)
Denmark	58
Estonia	54
Finland	55
France	93
Germany	81
Greece	77 (2)
Hungary	66
Iceland	1
Ireland	29
Italy	90
Latvia	59
Liechtenstein	20

Country	Total number of species
Lithuania	61
Luxembourg	62
Macedonia	60
Malta	15
Moldova	37 (2)
Montenegro	65
Netherlands	71
Norway	48
Poland	73
Portugal	65 (1)
Romania	67 (2)
Russia*	74
Serbia	61 (1)
Slovakia	73
Slovenia	71 (1)
Spain	82
Sweden	61
Switzerland	77 (1)
Turkey in Europe	56
Ukraine	73 (2)
United Kingdom	55

Figure 4. Distribution of endemic dragonflies in Europe

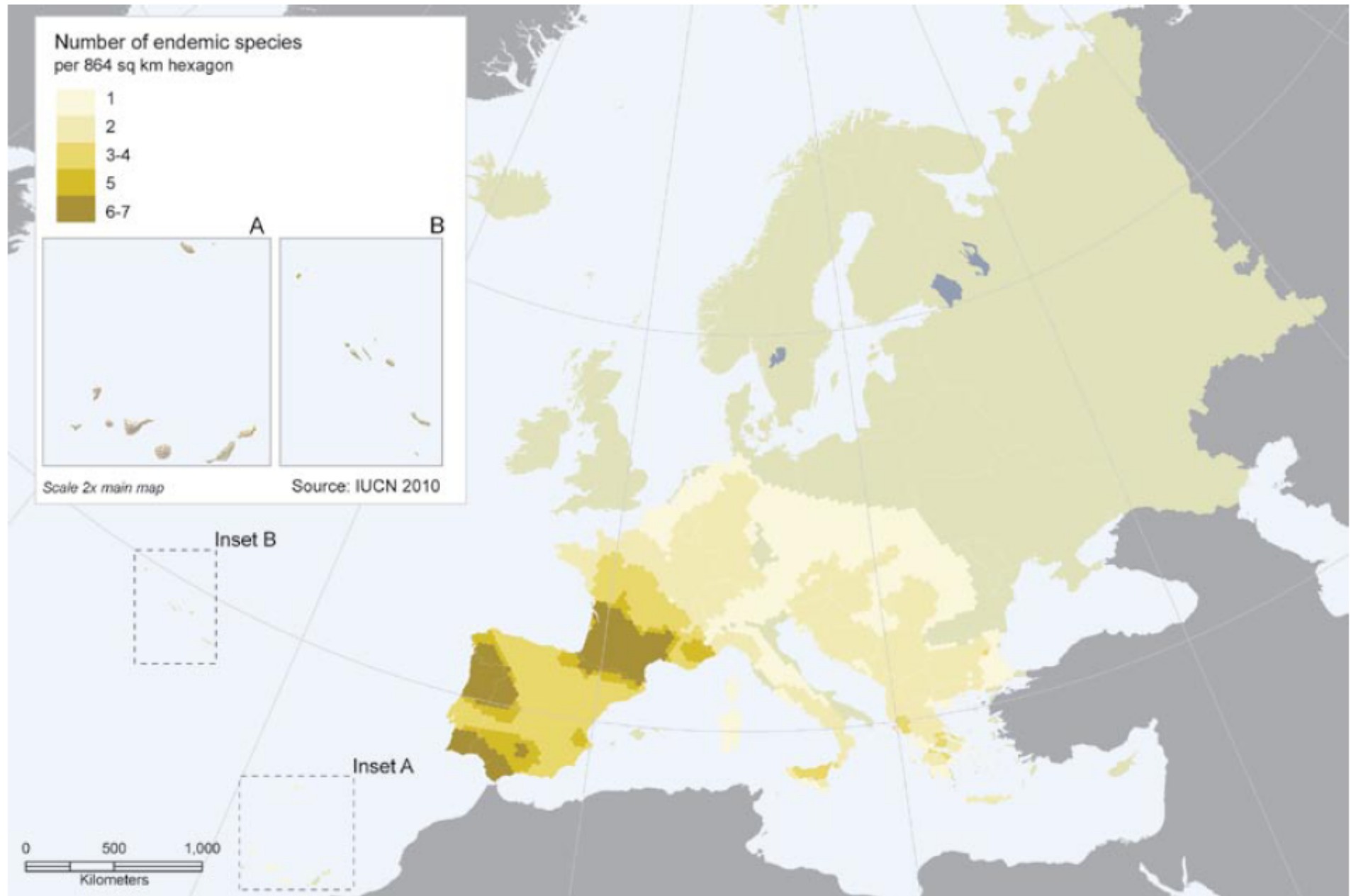


Table 2. The number of dragonfly (sub)species in each Red List Category

	IUCN Red List categories	No. (sub)species Europe (no. endemic species)	No. species EU 27 (no. endemic species)
Threatened categories	Critically Endangered (CR)	3 (2)	3 (1)
	Endangered (EN)	5 (3)	6 (3)
	Vulnerable (VU)	13 (3)	13 (2)
	Near Threatened (NT)	15 (4)	18 (2)
	Least Concern (LC)	96 (6)	91 (6)
	Data Deficient (DD)	5 (0)	3 (0)
	Total number of species assessed*	137 (18)	134 (14)

*Excluding the 5 species considered as Not Applicable.

Figure 5. Red List status of dragonflies in Europe.
See Table 2 for abbreviations.

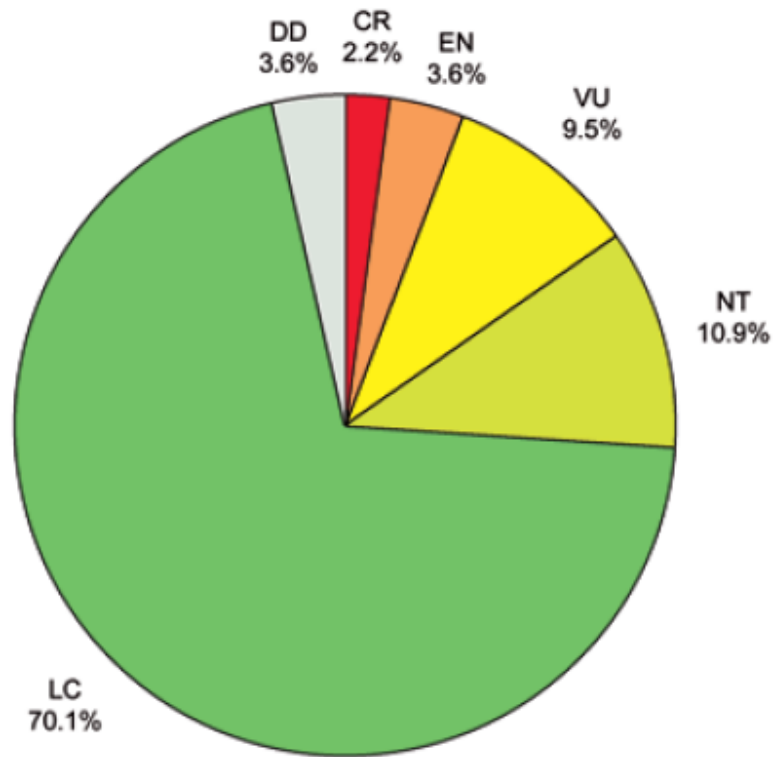


Figure 6. Red List status of dragonflies in the EU 27.
See Table 2 for abbreviations.

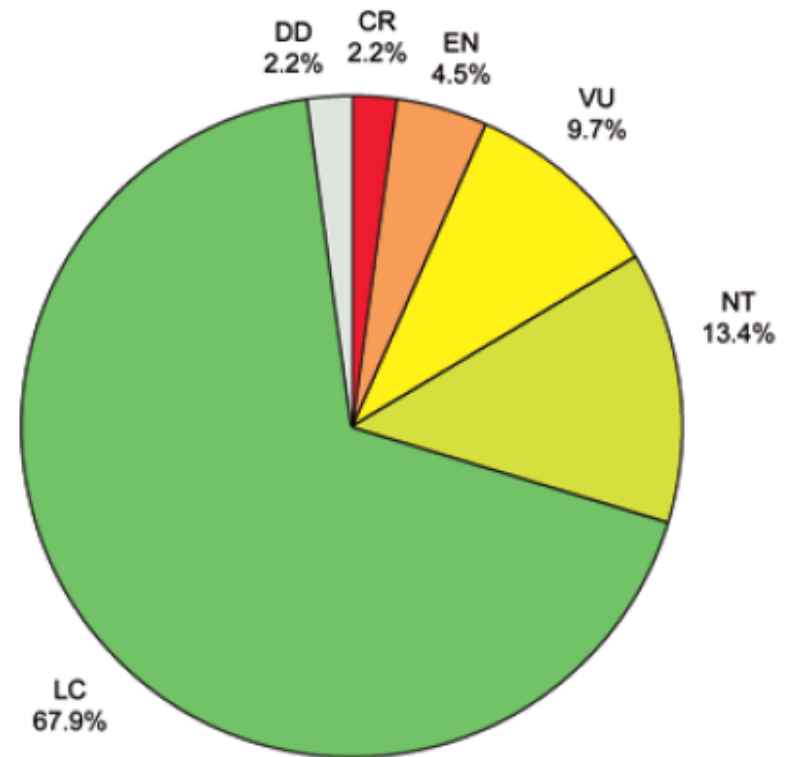


Table 4. Threatened dragonfly species at the European and EU 27 level. Species endemic to Europe or to EU 27 are marked with an asterisk (*).

Family	Species	Common Name	Europe	EU 27	Distribution
Coenagrionidae	<i>Ceriagrion georgifreyi</i>	Turkish Red Damsel	CR	CR	Balkan Peninsula
Coenagrionidae	<i>Pyrrhosoma elisabethae</i>	Greek Red Damsel	CR *	CR	Balkan Peninsula
Cordulegastridae	<i>Cordulegaster helladica ssp. kastalia</i>	Delphi Goldenring	CR *	CR *	Balkan Peninsula
Aeshnidae	<i>Boyeria cretensis</i>	Cretan Spectre	EN *	EN *	Crete
Gomphidae	<i>Onychogomphus costae</i>	Faded Pincertail	EN	EN	Iberian Pen. & S France
Cordulegastridae	<i>Cordulegaster helladica ssp. buchholzi</i>	Buchholz' Goldenring	EN *	EN *	Balkan Peninsula
Cordulegastridae	<i>Cordulegaster helladica ssp. helladica</i>	Greek Goldenring	EN *	EN *	Balkan Peninsula
Cordulegastridae	<i>Cordulegaster insignis</i>	Blue-eyed Goldenring	EN	EN	Balkan Peninsula
Lestidae	<i>Lestes macrostigma</i>	Dark Spreadwing	VU	EN	Mediterranean
Coenagrionidae	<i>Coenagrion hylas</i>	Frey's Damselfly	VU	VU	Central Europe
Coenagrionidae	<i>Coenagrion intermedium</i>	Cretan Bluet	VU *	VU *	Crete
Coenagrionidae	<i>Ischnura fontaineae</i>	Oasis Bluetail	VU	VU	Pantelleria
Coenagrionidae	<i>Ischnura hastata</i>	Citrine Forktail	VU	VU	Azores
Aeshnidae	<i>Anax immaculifrons</i>	Magnificent Emperor	VU	VU	Balkan Peninsula
Gomphidae	<i>Lindenia tetraphylla</i>	Bladetail	VU	VU	Mediterranean
Cordulegastridae	<i>Cordulegaster picta</i>	Turkish Goldenring	VU	VU	Balkan Peninsula
Macromiidae	<i>Macromia splendens</i>	Splendid Cruiser	VU *	VU *	Iberian Pen. & S France
Corduliidae	<i>Somatochlora borisi</i>	Bulgarian Emerald	VU *	VU	Balkan Peninsula
Libellulidae	<i>Orthetrum nitidinerve</i>	Yellow-veined Skimmer	VU	VU	Iberian Pen. & S France
Libellulidae	<i>Sympetrum depressiusculum</i>	Spotted Darter	VU	VU	S & C Europe
Libellulidae	<i>Zygonyx torridus</i>	Ringed Cascader	VU	VU	Iberian Pen. & Sicily
Coenagrionidae	<i>Nehalennia speciosa</i>	Sedgling	NT	VU	Central & NE Europe





Lestes macrostigma



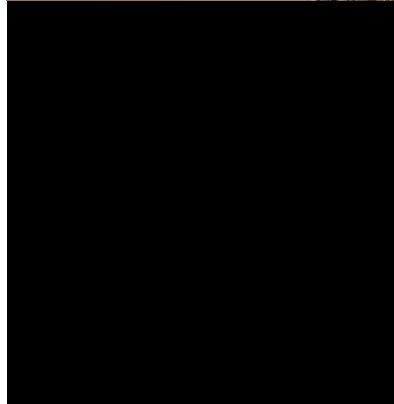
Lindenia tetraphylla



Zygonyx torridus



Ischnura fontainei



Nehalennia speciosa



Sympetrum depressiusculum

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Figure 8. Population trends of European dragonflies.

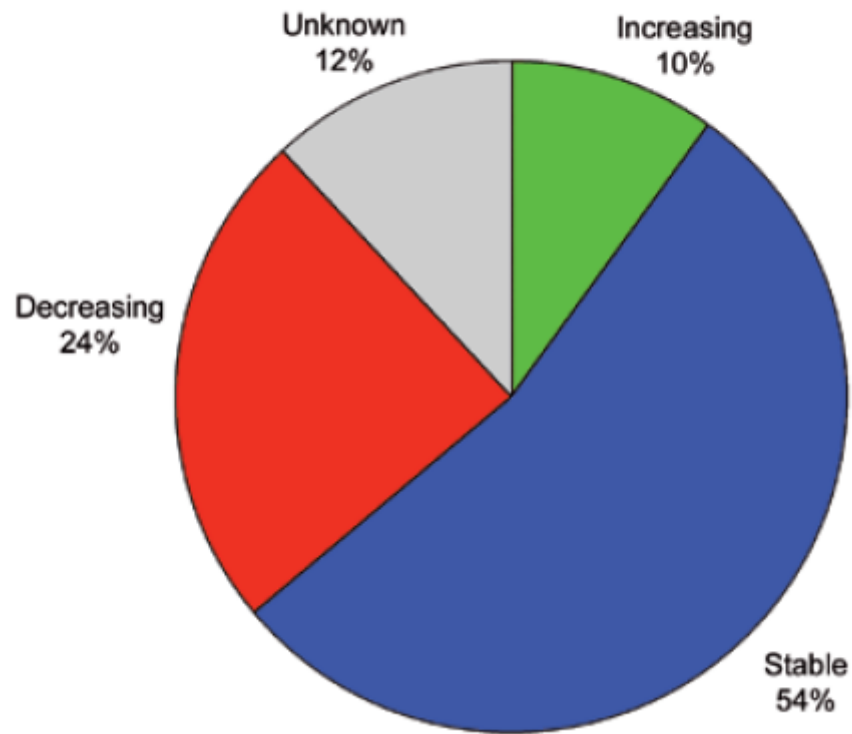


Figure 7. Distribution of threatened dragonflies in Europe.

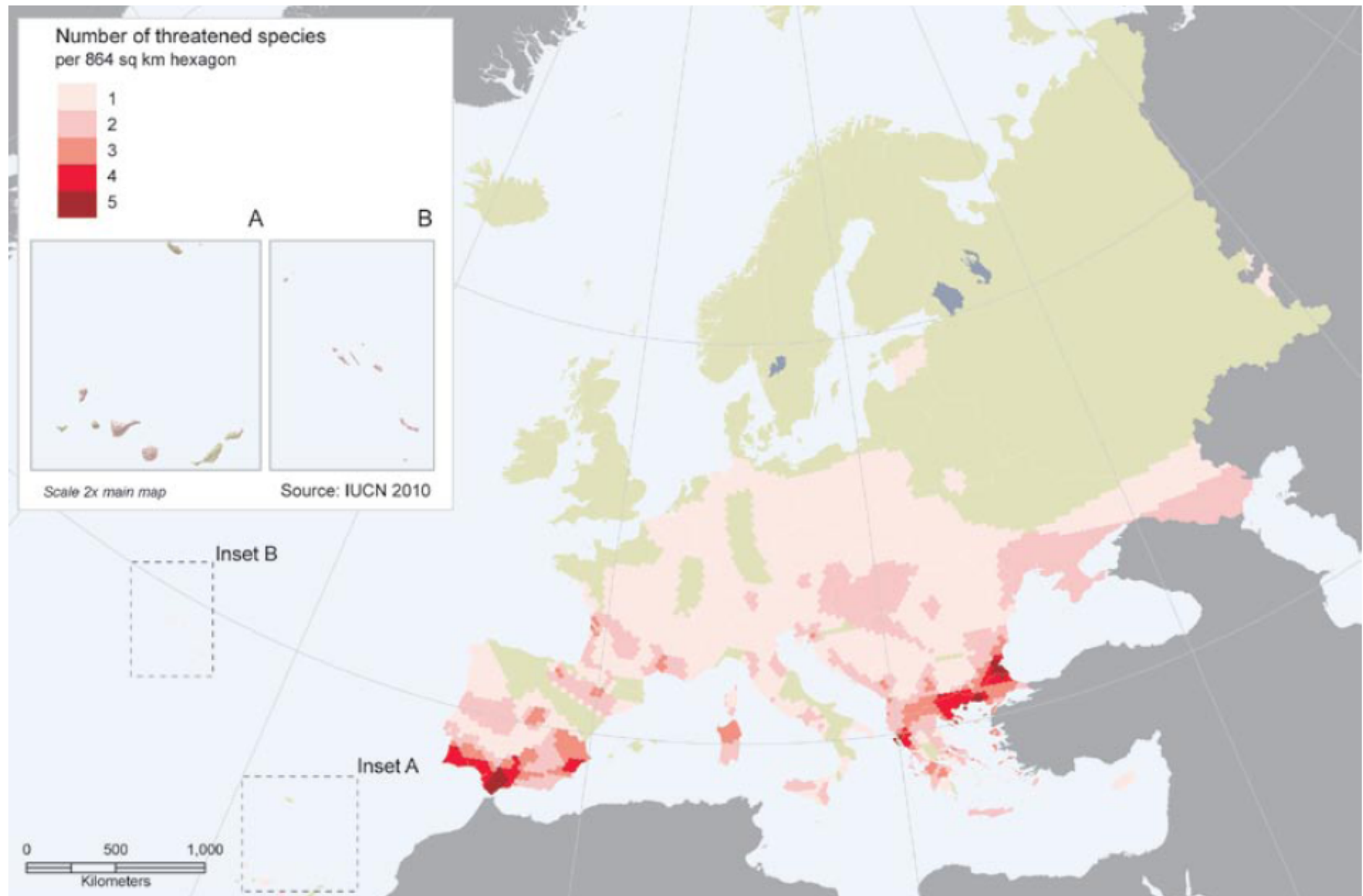


Figure 9. Major threats to dragonflies in Europe

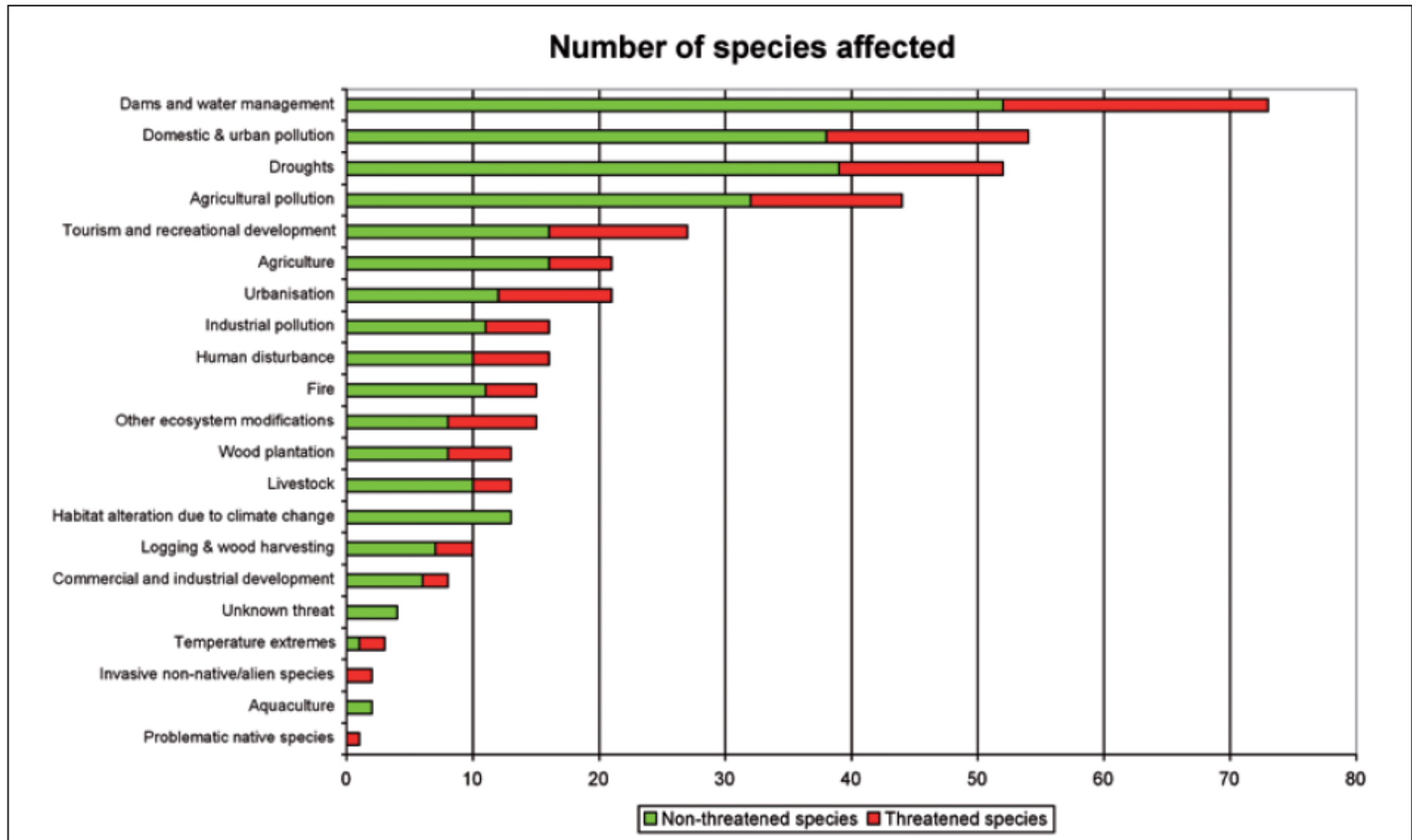


Table 5. Dragonflies which are either threatened or listed on Annexes II or IV of the Habitats Directive. Species endemic to Europe or to EU 27 are marked with an asterisk (*).

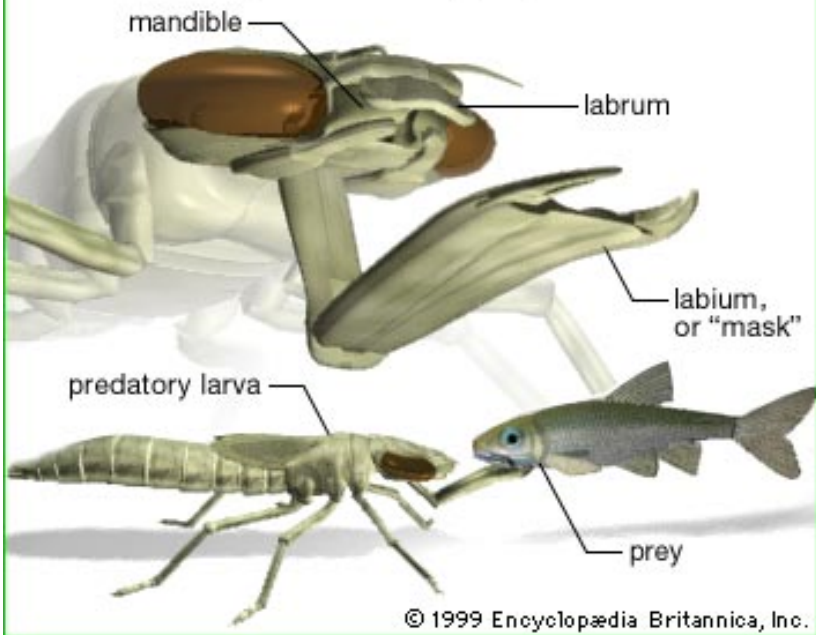
Family	Species	Common Name	Europe	EU 27	Annexes II	Annexes IV
Coenagrionidae	<i>Ceriagrion georgifreyi</i>	Turkish Red Damsel	CR	CR		
Coenagrionidae	<i>Pyrrhosoma elisabethae</i>	Greek Red Damsel	CR *	CR		
Cordulegastridae	<i>Cordulegaster helladica</i> sp. <i>kastalia</i>	Delphi Goldenring	CR *	CR *		
Aeshnidae	<i>Boyeria cretensis</i>	Cretan Spectre	EN *	EN *		
Gomphidae	<i>Onychogomphus costae</i>	Faded Pincertail	EN	EN		
Cordulegastridae	<i>Cordulegaster helladica</i> sp. <i>helladica</i>	Greek Goldenring	EN *	EN *		
Cordulegastridae	<i>Cordulegaster helladica</i> sp. <i>buchholzi</i>	Buchholz' Goldenring	EN *	EN *		
Cordulegastridae	<i>Cordulegaster insignis</i>	Blue-eyed Goldenring	EN	EN		
Lestidae	<i>Lestes macrostigma</i>	Dark Spreadwing	VU	EN		
Coenagrionidae	<i>Coenagrion hylas</i>	Frey's Damselfly	VU	VU	•	•
Coenagrionidae	<i>Coenagrion intermedium</i>	Cretan Bluet	VU *	VU *		
Coenagrionidae	<i>Ischnura fountaineae</i>	Oasis Bluetail	VU	VU		
Coenagrionidae	<i>Ischnura hastata</i>	Citrine Forktail	VU	VU		
Aeshnidae	<i>Anax immaculifrons</i>	Magnificent Emperor	VU	VU		
Gomphidae	<i>Lindenia tetraphylla</i>	Bladetail	VU	VU	•	•
Cordulegastridae	<i>Cordulegaster picta</i>	Turkish Goldenring	VU	VU		
Macromiidae	<i>Macromia splendens</i>	Splendid Cruiser	VU *	VU *	•	•
Corduliidae	<i>Somatochlora borisi</i>	Bulgarian Emerald	VU *	VU		
Libellulidae	<i>Orthetrum nitidinerve</i>	Yellow-veined Skimmer	VU	VU		
Libellulidae	<i>Sympetrum depressiusculum</i>	Spotted Darter	VU	VU		
Libellulidae	<i>Zygonyx torridus</i>	Ringed Cascader	VU	VU		
Coenagrionidae	<i>Nehalennia speciosa</i>	Sedgling	NT	VU		
Coenagrionidae	<i>Coenagrion mercuriale</i>	Mercury Bluet	NT	NT	•	
Coenagrionidae	<i>Coenagrion ornatum</i>	Ornate Bluet	NT	NT	•	
Aeshnidae	<i>Aeshna viridis</i>	Green Hawker	NT	NT		•
Gomphidae	<i>Gomphus graslinii</i>	Pronged Clubtail	NT	NT	•	•
Cordulegastridae	<i>Cordulegaster heros</i>	Balkan Goldenring	NT	NT	•	•
Cordulegastridae	<i>Cordulegaster trinacriae</i>	Italian Goldenring	NT	NT	•	•
Corduliidae	<i>Oxygastra curtisii</i>	Orange-spotted Emerald	NT	NT	•	•
Libellulidae	<i>Leucorrhinia albifrons</i>	Dark Whiteface	LC	NT		•
Libellulidae	<i>Leucorrhinia caudalis</i>	Lilypad Whiteface	LC	NT		•
Lestidae	<i>Sympetma paedisca</i>	Siberian Winter Damsel	LC	LC		•
Gomphidae	<i>Gomphus flavipes</i>	River Clubtail	LC	LC		•
Gomphidae	<i>Ophiogomphus cecilia</i>	Green Snaketail	LC	LC	•	•
Libellulidae	<i>Leucorrhinia pectoralis</i>	Yellow-spotted Whiteface	LC	LC	•	•



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Odonate mouthparts: the dragonfly larva



Dragonflies as tools: databases and monitoring

In a number of European countries, dragonflies are used as **indicators of freshwater habitat quality**.

They have the advantage that information about the adults can be collected relatively easily, as most species can be identified on sight.

Dragonflies are **increasingly popular** with volunteers, and are liked by the general public. As such, they can be used as **ambassadors of freshwater habitat conservation**, raising the awareness among non-specialists.

Dragonflies as tools: databases and monitoring



In order to use dragonflies as a quality indicator, **up-to-date information on their distribution is needed.**

For specific projects individual specialists can gather information, but to obtain countrywide data it is far more cost-effective to establish a **network of volunteers.**

Such networks have been implemented in several western European countries such as France, Belgium and Great Britain.

THREATS

Main threats to these species are the increasing demand for water and the increased frequency and duration of hot and dry periods. River species are affected by the construction of dams and reservoirs as well as by desiccation and (to a lesser extent) deteriorating water quality.

Species associated with **smaller streams** are declining due to desiccation caused by dry weather, fires and increased water extraction for local agriculture.

Three areas of high conservation priority with regard to European dragonflies have become evident: **Crete**, the **southern Balkans** and the **Iberian Peninsula/southern France**. **These priorities do not mean that no action is needed in other regions.**



European Red List of Butterflies

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In Europe, there are **482 species** of butterflies, 451 of them being also found in the 27 member states of the EU.

Almost a third of these species (**142 species**) are **endemic** to Europe.



Complex life cycle. Butterflies lay eggs that hatch into caterpillars, which then turn into chrysalises before becoming adults.

They have **very specific** food and habitat requirements that **differ in each stage** of their life cycle.

Caterpillar, chrysalis and adult of the Orange Tip *Anthocharis cardamines* (Least Concern). Photographs © Jaap Bouwman, Kars Veling and Chris van Swaay (De Vlinderstichting).



Egg → Caterpillar

The **butterflies** are a group of **two closely related superfamilies of Lepidoptera** (*Hesperioidea* and *Papilionoidea*) which form a small fraction (ca. 5%) of European Lepidoptera.

Chrysalise

The remaining species which belong to **29 superfamilies** are colloquially referred to as **moths**, because most of them fly during the night.

Imago (adult)

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

Class	Order	Family	Europe			EU27		
			Number of species	Number of endemic species	% of endemic species*	Number of species	Number of endemic species	% of endemic species*
Insecta	Lepidoptera	Hesperiidae	46	10	22%	44	3	7%
		Riodinidae	1	0	0%	1	0	0%
		Lycaenidae	129	31	25%	123	24	19%
		Nymphalidae	237	86	36%	219	40	18%
		Papilionidae	13	2	15%	12	2	17%
		Pieridae	56	13	23%	52	9	17%
Total			482	142	30%	451	78	17%

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

Coenonympha phryne. A species from pristine steppes in Russia and Ukraine, Critically Endangered in Europe. Photograph © Vladimir Savchuk



Overall, about **9%** of European butterflies are **threatened** in Europe, and 7% are threatened at the EU27 level. A further **10%** of butterflies are considered **Near Threatened**.

Despite the lack of good trend data in some countries, the study shows that about a third (**31%**) of the European butterflies has **declining populations**, while 4% are increasing and more than half of the species are stable.

For the remaining 10%, the current information is too limited to define their overall population trend.



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 butterflies.
- To identify those **geographic areas** and **habitats needing to be conserved** to prevent extinctions and to ensure that European butterflies reach and maintain a favourable conservation status.
- To identify the **major threats** and to propose mitigating measures and conservation actions to address them.
- To strengthen the network of experts focused on conservation of butterflies in Europe, so that the assessment **information can be kept current**, and expertise can be targeted to address the highest **conservation priorities**.

Figure 2. Regional assessments were made for two areas – geographical Europe and the EU 27



For each taxon the following data were entered into the Species Information Service (SIS) database:



- Species' taxonomic classification
- Geographic range (including a distribution map)
- Red List Category and Criteria
- Population information
- Habitat preferences
- Major threats
- Conservation measures
- Other general information
- Key literature references

Figure 5. Species richness of European butterflies

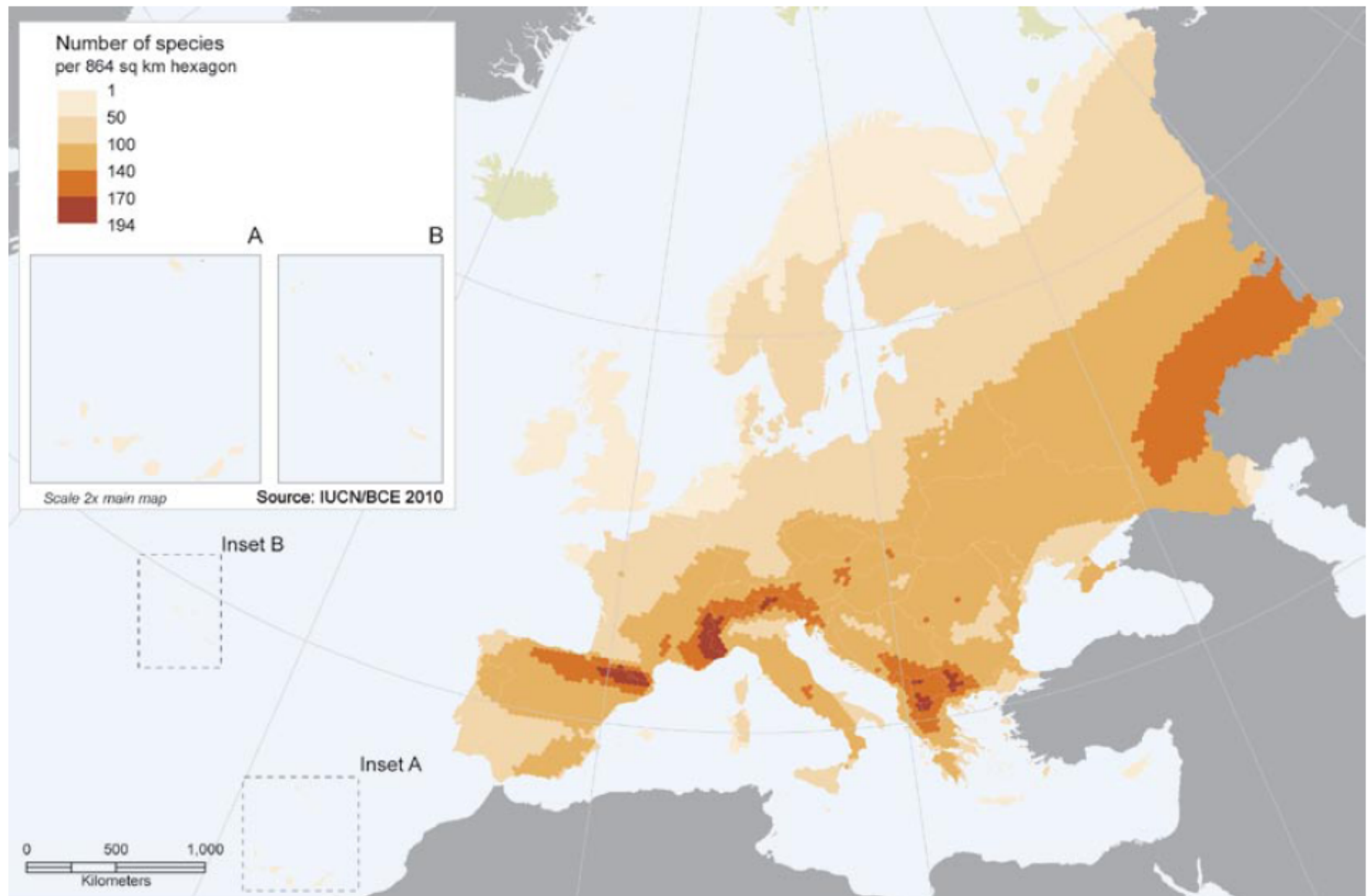


Table 6. Number of butterfly species in the 27 current EU Member States (excluding introduced species).

Country	Total number of species
Austria	197
Belgium	88
Bulgaria	211
Cyprus	48
Czech Republic	140
Denmark	63
Estonia	98
Finland	110
France	244
Germany	178
Greece	230
Hungary	152

Ireland	30
Italy	264
Latvia	105
Lithuania	114
Luxembourg	78
Malta	18
Netherlands	55
Poland	147
Portugal	147
Romania	180
Slovakia	164
Slovenia	172
Spain	243
Sweden	108
United Kingdom	55

Figure 7. Distribution of endemic butterfly species in Europe

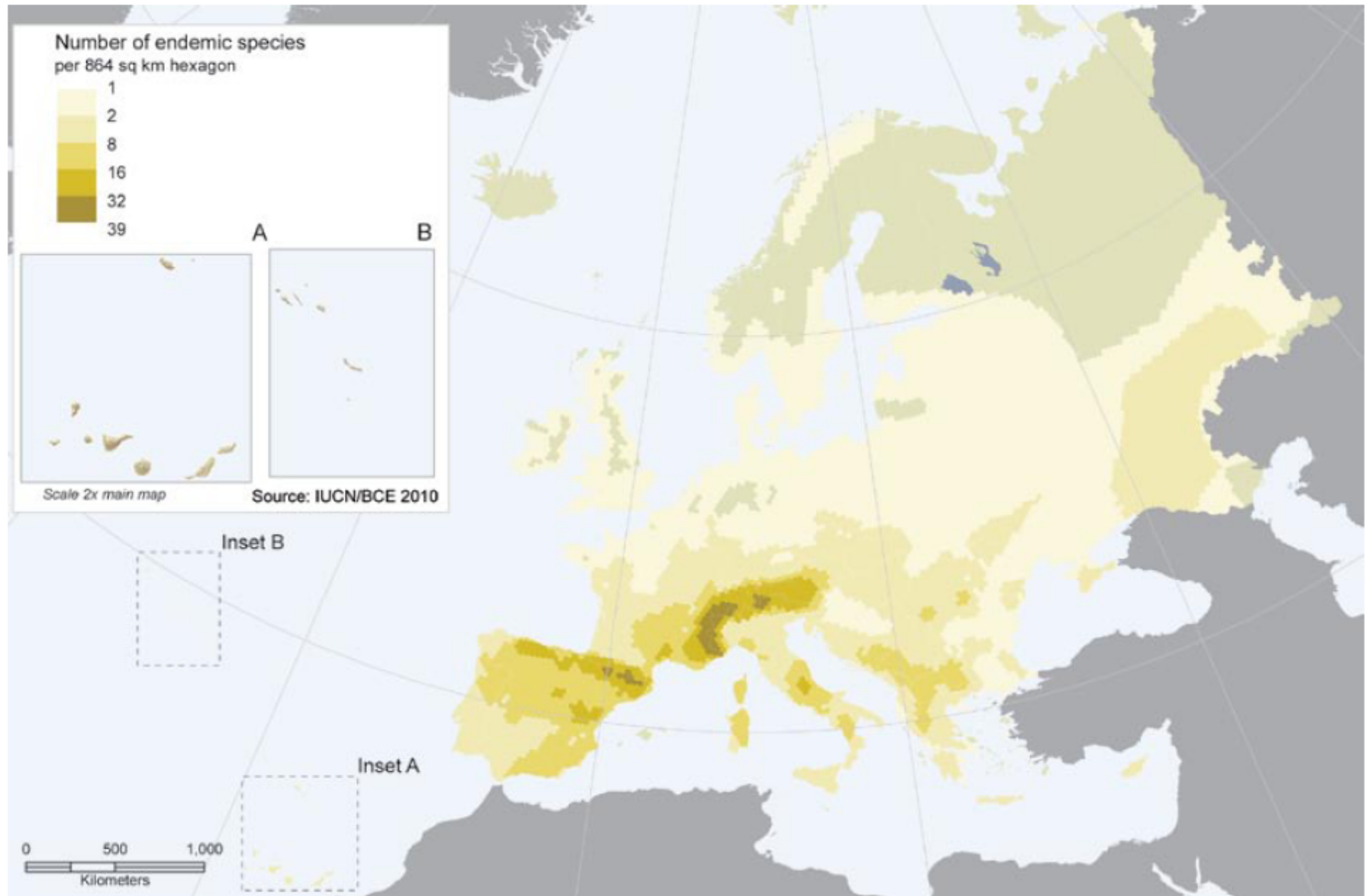


Table 3. Summary of numbers of European butterflies species within each category of threat

	IUCN Red List categories	No. species Europe (no. endemic species)	No. species EU 27 (no. endemic species)
Threatened categories	Regionally Extinct (RE)	1	2
	Critically Endangered (CR)	3 (2)	2 (1)
	Endangered (EN)	12 (6)	9 (5)
	Vulnerable (VU)	22 (14)	19 (10)
	Near Threatened (NT)	44 (11)	47 (7)
	Least Concern (LC)	349 (107)	338 (54)
	Data Deficient (DD)	4 (2)	4 (1)
	Total number of species assessed*	435 (142)	421 (78)

Figure 3. Red List status of butterflies in Europe

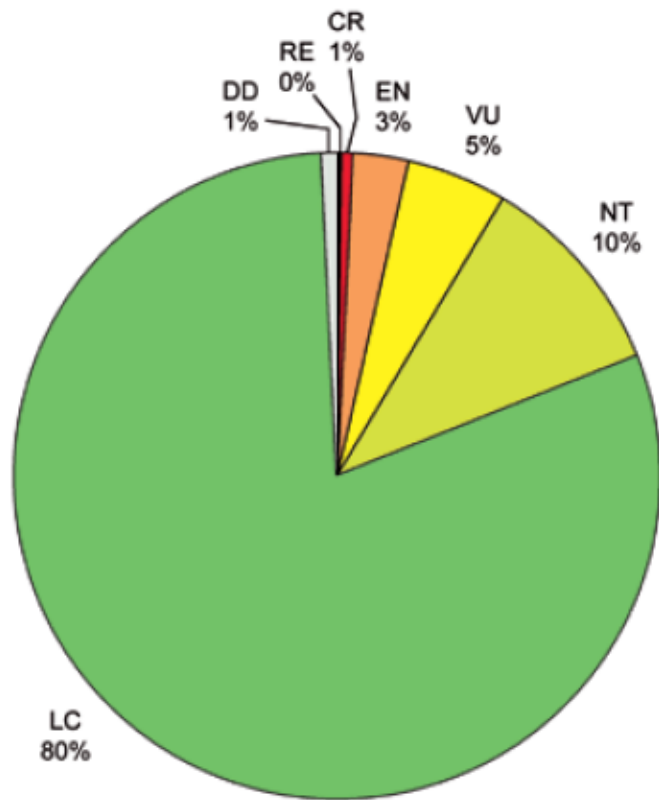


Figure 4. Red List status of butterflies in the EU27

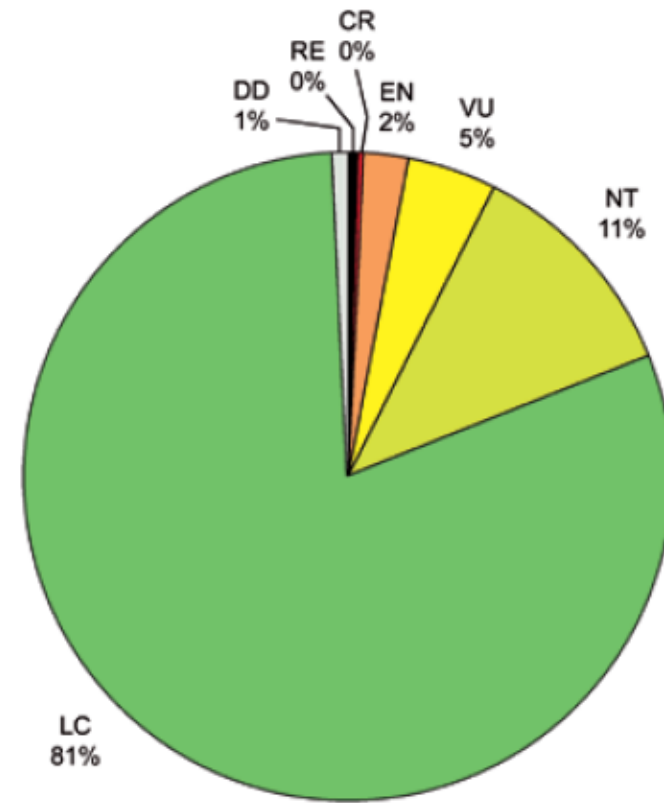


Table 4. Regionally Extinct, threatened or Near Threatened butterflies species at the European and EU27 level. Species endemic to Europe or to EU 27 are marked with an asterisk (*).

Family	Genus	Species	Common name	Red List status	
				Europe	EU27
LYCAENIDAE	<i>Aricia</i>	<i>hyacinthus</i>		RE	RE
PIERIDAE	<i>Pieris</i>	<i>wollastoni</i>	Madeiran Large White	CR*	CR*
NYMPHALIDAE	<i>Coenonympha</i>	<i>phryne</i>		CR	NE
NYMPHALIDAE	<i>Pseudochazara</i>	<i>cingovskii</i>	Macedonian Grayling	CR*	NE
PIERIDAE	<i>Colias</i>	<i>myrmidone</i>	Danube Clouded Yellow	EN	CR
LYCAENIDAE	<i>Lycaena</i>	<i>helle</i>	Violet Copper	EN	LC
LYCAENIDAE	<i>Phengaris</i>	<i>arion</i>	Large Blue	EN	EN
LYCAENIDAE	<i>Plebejus</i>	<i>zulichii</i>	Zulich's Blue	EN*	EN*
LYCAENIDAE	<i>Polyommatus</i>	<i>humedasae</i>	Piedmont Anomalous Blue	EN*	EN*
LYCAENIDAE	<i>Turanana</i>	<i>taygetica</i>	Odd-spot Blue	EN	EN
NYMPHALIDAE	<i>Boloria</i>	<i>improba</i>	Dusky-winged Fritillary	EN	EN
NYMPHALIDAE	<i>Coenonympha</i>	<i>oedippus</i>	False Ringlet	EN	LC
NYMPHALIDAE	<i>Pararge</i>	<i>xiphia</i>	Madeiran Speckled Wood	EN*	EN*
PIERIDAE	<i>Gonepteryx</i>	<i>maderensis</i>	Madeiran Brimstone	EN*	EN*
PIERIDAE	<i>Pieris</i>	<i>cheiranthi</i>	Canary Islands Large White	EN*	EN*
NYMPHALIDAE	<i>Pseudochazara</i>	<i>euxina</i>		EN*	NE

ITA EX



Lycaena helle



Table 4. Regionally Extinct, threatened or Near Threatened butterflies species at the European and EU27 level. Species endemic to Europe or to EU 27 are marked with an asterisk (*).

Family	Genus	Species	Common name	Red List status	
				Europe	EU27
LYCAENIDAE	<i>Aricia</i>	<i>hyacinthus</i>		RE	RE
PIERIDAE	<i>Pieris</i>	<i>wollastoni</i>	Madeiran Large White	CR*	CR*
NYMPHALIDAE	<i>Coenonympha</i>	<i>phryne</i>		CR	NE
NYMPHALIDAE	<i>Pseudochazara</i>	<i>cingovskii</i>	Macedonian Grayling	CR*	NE
PIERIDAE	<i>Colias</i>	<i>myrmidone</i>	Danube Clouded Yellow	EN	CR
LYCAENIDAE	<i>Lycaena</i>	<i>helle</i>	Violet Copper	EN	LC
LYCAENIDAE	<i>Phengaris</i>	<i>arion</i>	Large Blue	EN	EN
LYCAENIDAE	<i>Plebejus</i>	<i>zullichi</i>	Zullich's Blue	EN*	EN*
LYCAENIDAE	<i>Polyommatus</i>	<i>humedasae</i>	Piedmont Anomalous Blue	EN*	EN*
LYCAENIDAE	<i>Turanana</i>	<i>taygetica</i>	Odd-spot Blue	EN	EN
NYMPHALIDAE	<i>Boloria</i>	<i>improba</i>	Dusky-winged Fritillary	EN	EN
NYMPHALIDAE	<i>Coenonympha</i>	<i>oedippus</i>	False Ringlet	EN	LC
NYMPHALIDAE	<i>Pararge</i>	<i>xiphia</i>	Madeiran Speckled Wood	EN*	EN*
PIERIDAE	<i>Gonepteryx</i>	<i>maderensis</i>	Madeiran Brimstone	EN*	EN*
PIERIDAE	<i>Pieris</i>	<i>cheiranthi</i>	Canary Islands Large White	EN*	EN*
NYMPHALIDAE	<i>Pseudochazara</i>	<i>euxina</i>		EN*	NE

ITA EX

Endem

Table 4. Regionally Extinct, threatened or Near Threatened butterflies species at the European and EU27 level. Species endemic to Europe or to EU 27 are marked with an asterisk (*).

Family	Genus	Species	Common name	Red List status	
				Europe	EU27
LYCAENIDAE	<i>Tomares</i>	<i>nogelii</i>	Nogel's Hairstreak	VU	RE
HESPERIIDAE	<i>Pyrgus</i>	<i>cirsii</i>	Cinquefoil Skipper	VU*	VU
LYCAENIDAE	<i>Phengaris</i>	<i>teleius</i>	Scarce Large Blue	VU	VU
LYCAENIDAE	<i>Polyommatus</i>	<i>galloi</i>	Higgin's Anomalous Blue	VU*	VU*
LYCAENIDAE	<i>Polyommatus</i>	<i>golgus</i>	Sierra Nevada Blue	VU*	VU*
LYCAENIDAE	<i>Polyommatus</i>	<i>orphicus</i>		VU*	VU*
LYCAENIDAE	<i>Polyommatus</i>	<i>violetae</i>	Andalusian Anomalous Blue	VU*	VU*
NYMPHALIDAE	<i>Boloria</i>	<i>polaris</i>	Polar Fritillary	VU	VU
NYMPHALIDAE	<i>Coenonympha</i>	<i>hero</i>	Scarce Heath	VU	VU
NYMPHALIDAE	<i>Erebia</i>	<i>christi</i>	Raetzer's Ringlet	VU*	VU
NYMPHALIDAE	<i>Erebia</i>	<i>sudetica</i>	Sudeten Ringlet	VU*	VU
NYMPHALIDAE	<i>Hipparchia</i>	<i>bacchus</i>	El Hierro Grayling	VU*	VU*
NYMPHALIDAE	<i>Hipparchia</i>	<i>tilosi</i>	La Palma Grayling	VU*	VU*
NYMPHALIDAE	<i>Lopinga</i>	<i>achine</i>	Woodland Brown	VU	VU
NYMPHALIDAE	<i>Pseudochazara</i>	<i>amymone</i>		VU*	VU*
NYMPHALIDAE	<i>Pseudochazara</i>	<i>orestes</i>	Dils' Grayling	VU*	VU*
PIERIDAE	<i>Colias</i>	<i>chrysotheme</i>	Lesser Clouded Yellow	VU	VU
PIERIDAE	<i>Euchloe</i>	<i>bazae</i>	Spanish Greenish Black-tip	VU*	VU*
PIERIDAE	<i>Gonepteryx</i>	<i>cleobule</i>	Canary Brimstone	VU*	VU*
NYMPHALIDAE	<i>Coenonympha</i>	<i>tullia</i>	Large Heath	VU	NT
NYMPHALIDAE	<i>Euphydryas</i>	<i>maturna</i>	Scarce Fritillary	VU	LC
NYMPHALIDAE	<i>Coenonympha</i>	<i>orientalis</i>	Balkan Heath	VU*	DD

Figure 9. Population trends of European butterflies

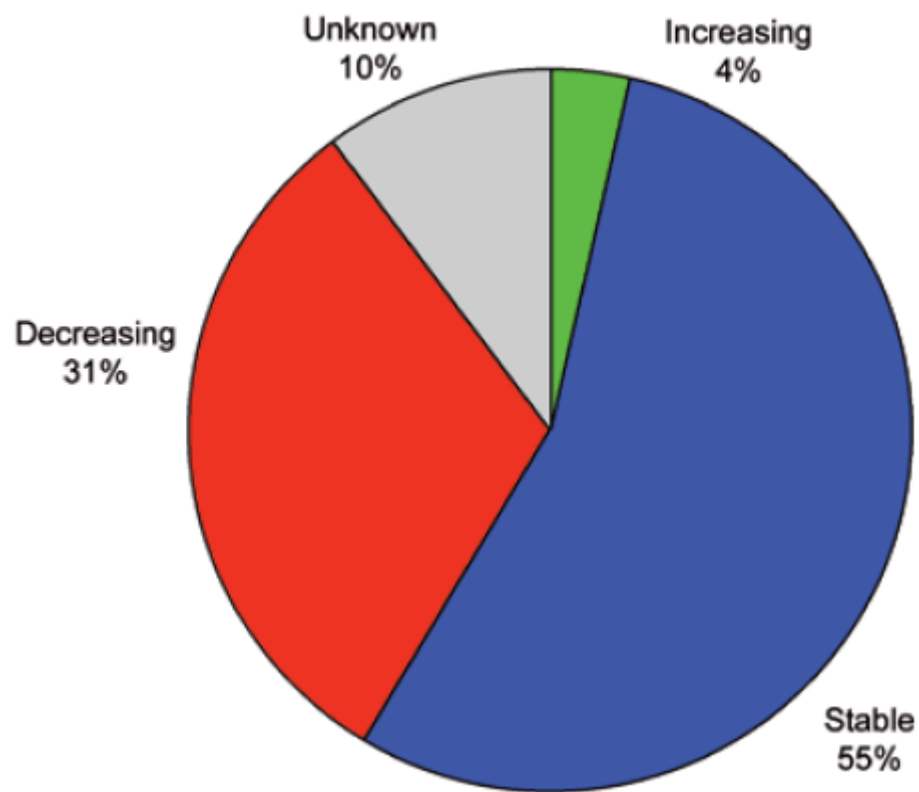


Figure 6. Distribution of threatened butterflies in Europe

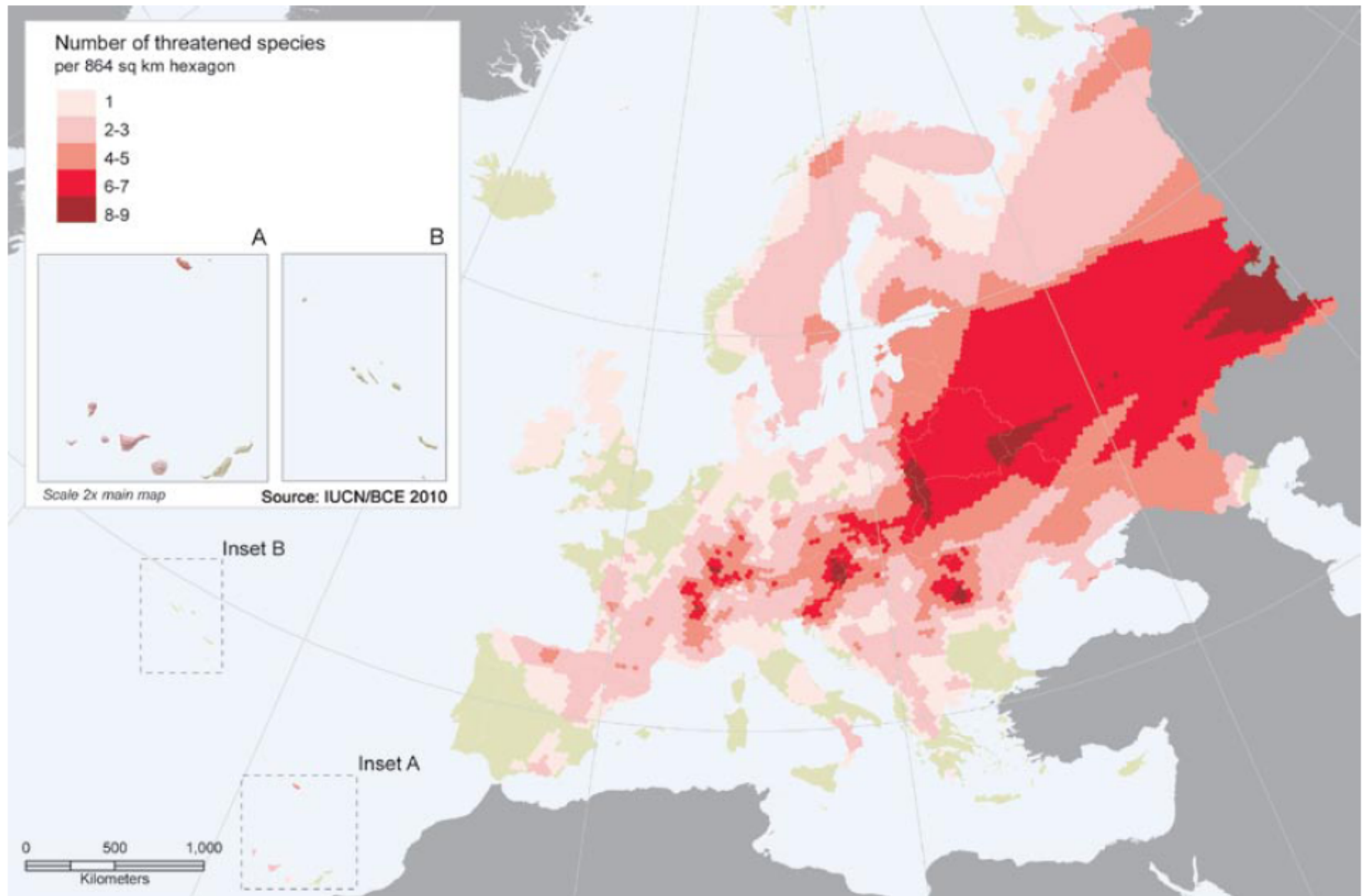


Figure 8. Major threats to butterflies in Europe

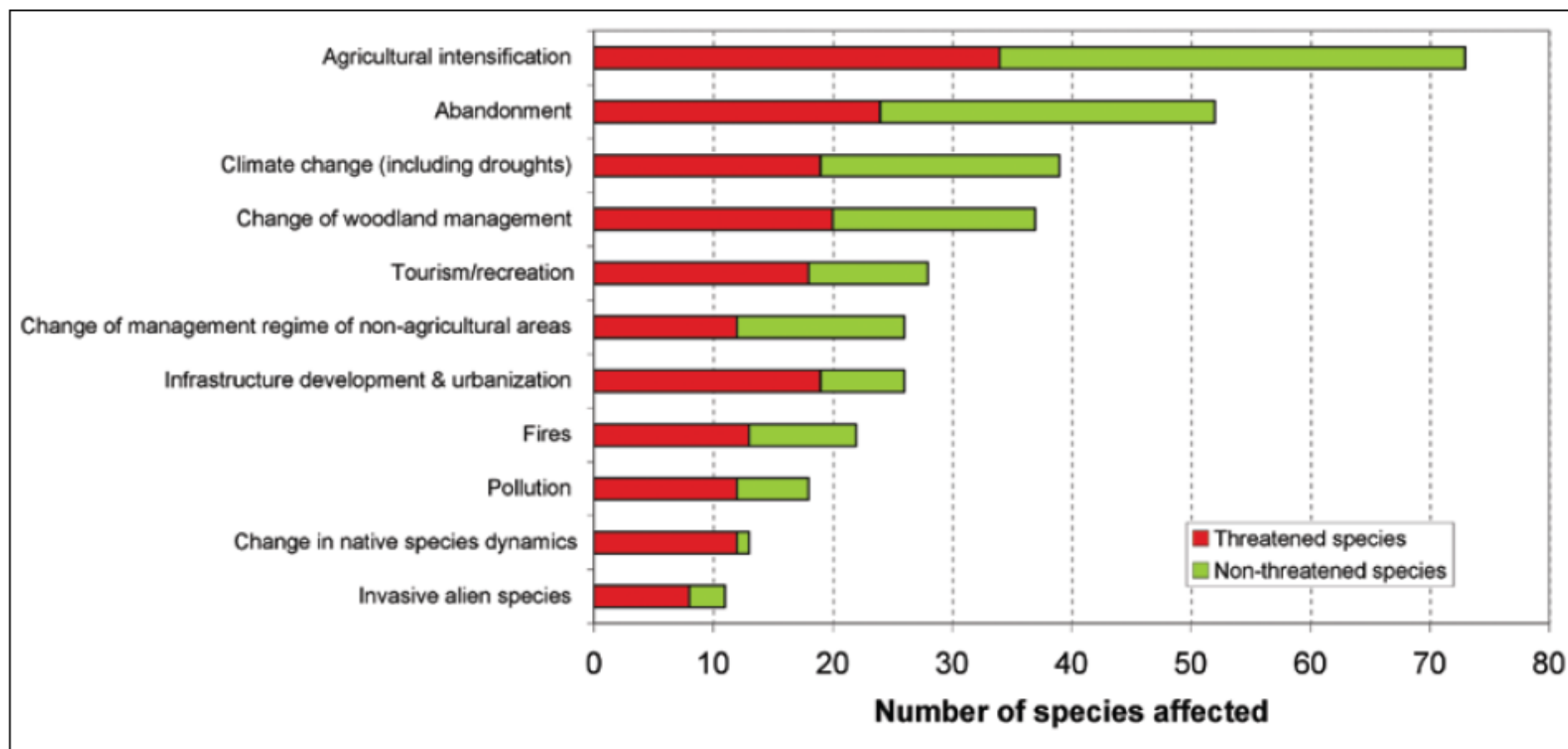


Table 7. The threatened butterfly taxa identified by the assessment and their presence on either Annexes II and IV of the Habitats Directive or Appendices II or III of the Bern Convention. An asterisk (*) indicates that the species is a priority species for the Habitats Directive.

Genus	Species	Red List status		Habitats Directive Annexes	Bern Convention Annexes
		Europe	EU27		
<i>Aricia</i>	<i>hyacinthus</i>	RE	RE		
<i>Pieris</i>	<i>wollastoni</i>	CR	CR		
<i>Coenonympha</i>	<i>phryne</i>	CR	NE		
<i>Pseudochazara</i>	<i>cingovskii</i>	CR	NE		
<i>Colias</i>	<i>myrmidone</i>	EN	CR	II/IV	
<i>Phengaris</i>	<i>arion</i> ¹	EN	EN	II/IV	II
<i>Plebejus</i>	<i>zulichii</i>	EN	EN		
<i>Polyommatus</i>	<i>humedasae</i>	EN	EN		II
<i>Turanana</i>	<i>taygetica</i>	EN	EN		
<i>Boloria</i>	<i>improba</i>	EN	EN	II ²	
<i>Pararge</i>	<i>xiphia</i>	EN	EN		
<i>Gonepteryx</i>	<i>maderensis</i>	EN	EN		
<i>Pieris</i>	<i>cheiranthi</i>	EN	EN		
<i>Lycaena</i>	<i>helle</i>	EN	LC	II/IV	
<i>Coenonympha</i>	<i>oedippus</i>	EN	LC	II/IV	II
<i>Pseudochazara</i>	<i>euxina</i>	EN	NE		
<i>Tomares</i>	<i>nogelii</i>	VU	RE		
<i>Pyrgus</i>	<i>cirsii</i>	VU	VU		
<i>Phengaris</i>	<i>teleius</i> ³	VU	VU	II/IV	II
<i>Polyommatus</i>	<i>galloi</i>	VU	VU		II
<i>Polyommatus</i>	<i>golgus</i>	VU	VU	IV ⁴	II ⁴
<i>Polyommatus</i>	<i>orphicus</i>	VU	VU		
<i>Polyommatus</i>	<i>violetae</i>	VU	VU		
<i>Boloria</i>	<i>polaris</i>	VU	VU		
<i>Coenonympha</i>	<i>hero</i>	VU	VU	II/IV	II
<i>Erebia</i>	<i>christi</i>	VU	VU	II/IV	II
<i>Erebia</i>	<i>sudetica</i>	VU	VU	II/IV	II
<i>Hipparchia</i>	<i>bacchus</i>	VU	VU		
<i>Hipparchia</i>	<i>tilosi</i>	VU	VU		
<i>Lopinga</i>	<i>achine</i>	VU	VU	IV	II
<i>Pseudochazara</i>	<i>amymone</i>	VU	VU		
<i>Pseudochazara</i>	<i>orestes</i>	VU	VU		
<i>Colias</i>	<i>chrysotheme</i>	VU	VU		
<i>Euchloe</i>	<i>bazae</i>	VU	VU		
<i>Gonepteryx</i>	<i>cleobule</i>	VU	VU		
<i>Coenonympha</i>	<i>tullia</i>	VU	NT		
<i>Euphydryas</i>	<i>maturna</i>	VU	LC	II/IV ⁵	II ⁵
<i>Coenonympha</i>	<i>orientalis</i>	VU	DD		
<i>Leptidea</i>	<i>morsei</i>	NT	EN	II/IV	
<i>Nymphalis</i>	<i>vauualbum</i>	LC	VU	II*/IV	



Butterflies as tools: databases and monitoring

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 also provides an important tool in establishing priorities for species conservation.



Butterflies as tools: databases and monitoring

Butterflies have **very specific food and habitat requirements at different stages of their life cycle**. They are therefore particularly sensitive to modifications of their environment and serve as an excellent indicator of the status of the ecosystems.

They are **especially sensitive to changes in habitat management** such as overgrazing, undergrazing or changes in forestry practice. More than half of the butterfly species inhabit grasslands, woodland and scrub are home to about a quarter of the species, while the rest are found in other types of ecosystems (rocky slopes, etc.).

The major drivers of butterfly habitat loss and degradation are related to **agricultural intensification**, for example through conversion of grasslands to crop fields, the improvement of flower-rich grasslands, drainage of wetlands, and the intensification of livestock grazing.



CONCLUSIONS

- Butterflies are important **biodiversity indicators** and play an important role in ecosystems, e.g. through their pollination activities.
- This report highlights where the
 - highest **diversity**,
 - highest level of **endemism** and
 - highest **portion of threatened butterflies** are found within the European region.



CONCLUSIONS

■ Despite a **lack of good trend data** from many countries, the results show that about **a third of European butterflies species experienced a decline** in their populations over the last 10 years and 9% are threatened.

■ It should be noted that **both the distribution and population size of numerous species have declined severely during the 20th century** (but not in the time frame of 10 years or three generations taken into consideration by IUCN methodology), especially in Western Europe. In some cases the few remaining populations in these countries are nowadays **stable as a result of conservation measures**, which means these species do not occur in the list of threatened species.



CONCLUSIONS

- The main long-term threat identified is the **loss an degradation of suitable habitat** in relation to changes in land-use, in particular **intensification of agriculture** (especially of grazing) and abandonment of land, leading to **invasion of shrub and trees**.
- **Climate change** is already having an impact on several butterfly species and is likely to have a strong effect on many more in the future.



CONCLUSIONS

- In order to improve the conservation status of European butterflies and to reverse their decline, **further conservation actions are urgently needed**. In particular: ensuring the adequate protection and management of key butterfly habitats and their surrounding areas, drawing up Species Action Plans for the most threatened species, establishing monitoring programmes, improving land management policies such as the **European Agricultural Policy**, and revising national and **European legislation**, adding species identified as threatened where needed.
- While some threatened species already receive some protection and conservation actions, **others currently receive little or no attention**.



CONCLUSIONS

■ **Monitoring programmes exist in only a small number of European countries** and need to be established in all countries in order to determine objective population trends and improve the accuracy of red listing in future years.

Such monitoring programmes would also help **evaluate the impact of conservation measures** on this important indicator group of insects.



European Red List of Saproxylic Beetles

Compiled by Ana Nieto and Keith N.A. Alexander



Saproxylic beetles represent an ecological grouping and are not an entire taxonomic group.

Saproxylic beetles, are beetles depending on wood decay.

This European Red List consists of a selection of **436 saproxylic beetles** native to Europe. Nearly a third of them are endemic to Europe.

A small number of the species considered may not be truly saproxylic beetles and that others may be facultative saproxylics rather than obligate saproxylics.



European Red List of Saproxylic Beetles

Compiled by Ana Nieto and Keith N.A. Alexander



Overall, nearly **11%** of the assessed saproxylic beetles (**46 species**) are **considered threatened** in all of Europe, while at the EU 27 level, 14% (57 species) are threatened.

A further **13%** of saproxylic beetles are considered **Near Threatened (56 species)**.

However, for more than a quarter of the species (**122 species - 28%**), there was not enough scientific information to evaluate their risk of extinction and they were classified as **Data Deficient** - when more data become available, many of these might prove to be threatened too.

Almost **14%** of the species assessed have **declining populations**. Approximately 27% are more or less stable and only 2% are increasing. The population trend for 249 species (**57%**) remains **unknown**.



The beetles (*Coleoptera*), with more than **350,000 known species** and with new species frequently discovered, rank as the largest order in the animal kingdom



Saproxylic beetles, are **beetles depending on wood decay.**

In Europe, beetles comprise **several ten-thousand of species**, exhibiting a rich variety of form as well as varied life-cycle strategies.

The **total number** of saproxylic beetle species **is not currently known** but it is undoubtedly very large, consisting of thousands of different species.

Beetles undergo complete metamorphosis; beetle larvae pupate, and from this pupa emerges a fully formed, sexually mature adult beetle, or imago. A single female may lay from **several dozen to several thousand eggs during her lifetime**, depending on the species.

Like adult beetles, the larvae are varied in appearance, particularly between beetle families.

Adults have an **extremely variable lifespan, from weeks to years**, depending on the species.

Larva of *Osmoderma cristinae* (Endangered). This species is endemic to Sicily. It inhabits hollow veteran broad-leaved trees with decaying heartwood which is a habitat declining in Europe due to unsuitable techniques of land management. Moreover, there is very little regeneration of suitable habitat across the species' range; once the existing veteran trees have died, there will be no replacements in many areas. Action is urgently needed to protect and appropriately manage existing veteran trees, as well as to ensure that suitable habitat continues to be available in future. Photograph © Nicolas Gouix and Hervé Brustel.



Saproxylic beetles are species which are **involved in or dependent on wood decay** and therefore play an important role in **decomposition processes** and thus for **recycling nutrients** in natural ecosystems.

They are associated with both living and dead trees. Wood use has led to **morphological, anatomical** and **metabolic adaptations** for the exploitation of a recalcitrant and nutrient-poor resource.



Saproxylic insect richness depends on:

- **quantity** and
- **quality of the dead wood** available in the forest, and
- **on forest size,**
- **fragmentation** and
- **management.**

Dead and decaying wood offers a **broad range of potential microhabitats** and the different saproxylic insects **segregate spatially according to**

- **tree species,**
- **kind of tissue** and
- **position** in the tree.

Aside of this spatial segregation, a **temporal segregation** occurs in relation to the degradative succession during wood decay. Many stages can be recognized in this decay, each of them having a specific saproxylic fauna.

Key factors:

- i) the total number of trees needed to maintain population viability;
- ii) the preferred tree density, as many beetle species require open-grown trees, while others favour shadier conditions;
- iii) age structure of the tree population; and
- iv) management history

Saproxylic beetles furthermore **interact with other groups of living organisms** that are very important for the well being of ecosystems and economy, such as mites, nematodes, bacteria and fungi.

The beetles may carry these organisms from tree to tree and from shrub to shrub, helping to **disseminate** them in the habitat.

Many are also involved in **pollination**.



Much is left to learn about the saproxylic beetles of Europe. Despite all the efforts of generations of entomologists, the biology of many species is still poorly known. Any research on saproxylic beetles enhances our knowledge of the functioning of ecosystems in wooded landscapes.

Table 1. Diversity and endemism in selected saproxylic beetle families in Europe¹.

Class	Order	Family (Subfamily)	Europe		EU 27	
			Number of species	Number of endemic species (% endemic)	Number of species	Number of endemic species (% endemic)
Insecta	Coleoptera	Anobiidae	1	1	1	1
		Boridae*	1	0	1	0
		Bostrichidae*	22	3 (13.6%)	22	3 (13.6%)
		Buprestidae	1	1	1	0
		Cerambycidae	153	32	138	17
		(Cerambycinae* Prioninae*)	142	31 (21.8%)	128	17 (13.3%)
		(Lamiinae)	11	1	10	0
		Cerophytidae*	1	0	1	0
		Cetoniidae*	24	8 (33.3%)	23	4 (17.4%)
		Cucujidae*	6	2 (33.3%)	6	1 (16.7%)
		Elateridae*	115	56 (48.7%)	110	41 (37.3%)
		Erotylidae*	23	9 (39.1%)	23	4 (17.4%)
		Euchiridae*	2	1 (50%)	2	1 (50%)
		Eucnemidae*	31	15 (48.4%)	29	4 (13.8%)
		Latridiidae	1	0	1	0
		Leiodidae	1	1	1	0
		Lucanidae*	14	6 (42.9%)	14	4 (28.6%)
		Melandryidae	1	0	1	0
		Mycetophagidae*	15	2 (13.3%)	14	0
		Prostomidae*	1	0	1	0
		Pythidae*	3	0	3	0
Rhysodidae*	3	0	3	0		
Trogositidae*	16	6 (37.5%)	13	3 (23.1%)		
Total		435	143	408	83	

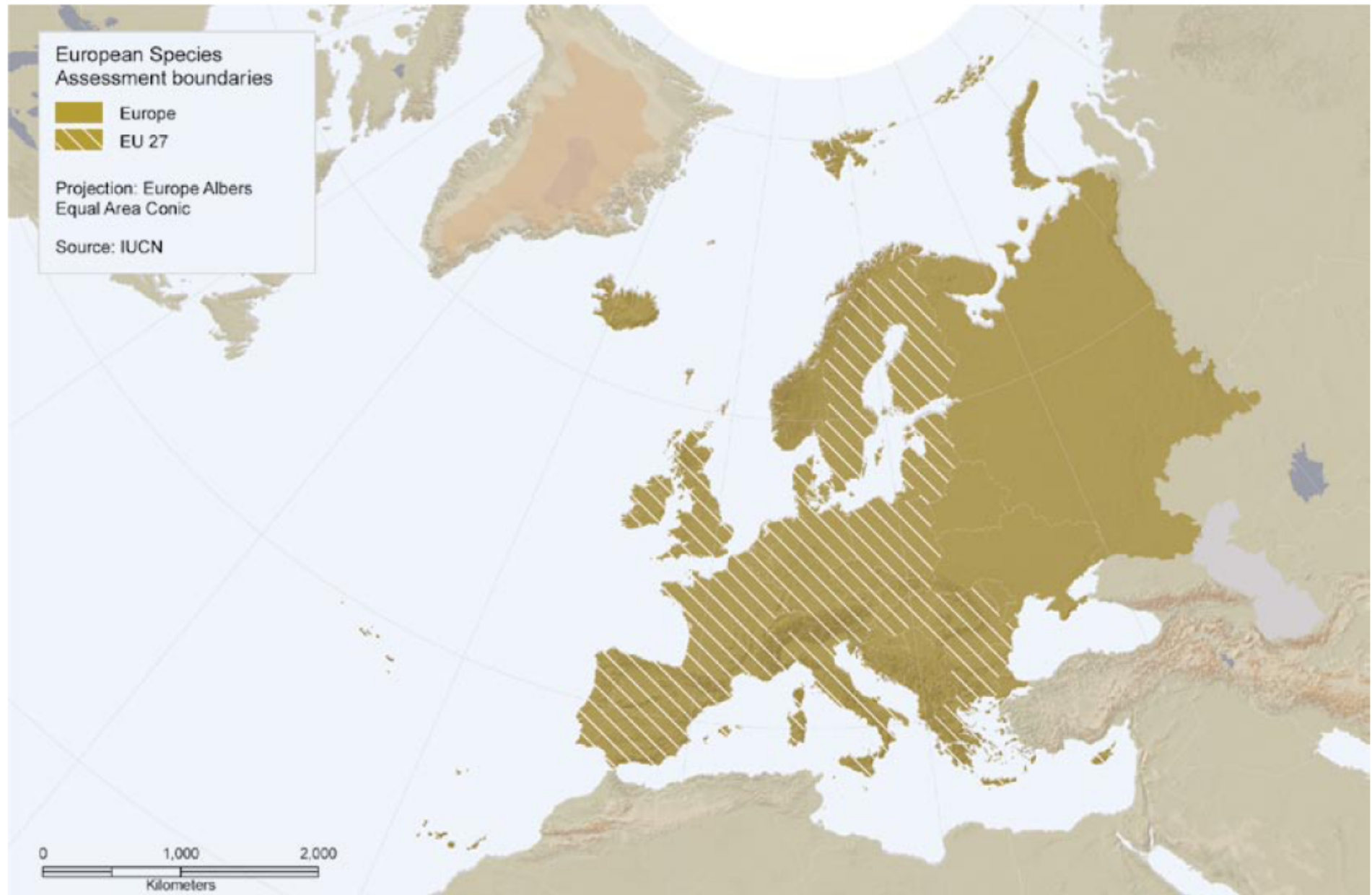
* An asterisk indicates that the family (or subfamily) has been fully assessed. Only for these families the % of endemic species is shown.



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 saproxylic beetles.
- To identify those **geographic areas** and **habitats needing to be conserved** to prevent extinctions and to ensure that European saproxylic beetles reach and maintain a favourable conservation status.
- To identify the **major threats** and to propose mitigating measures and conservation actions to address them.
- To strengthen the network of experts focused on saproxylic beetles conservation in Europe, so that the assessment **information can be kept current**, and expertise can be targeted to address the highest **conservation priorities**.

Figure 2. Regional assessments were made for two areas – continental Europe and the EU



For the saproxylic beetle species that are part of this study, the following data were compiled:



- Species' taxonomic classification
- Geographic range (including a distribution map)
- Red List Category and Criteria
- Population information
- Habitat preferences
- Major threats
- Conservation measures
- Other general information
- Key literature references

Figure 5. Species richness of European saproxylic beetles

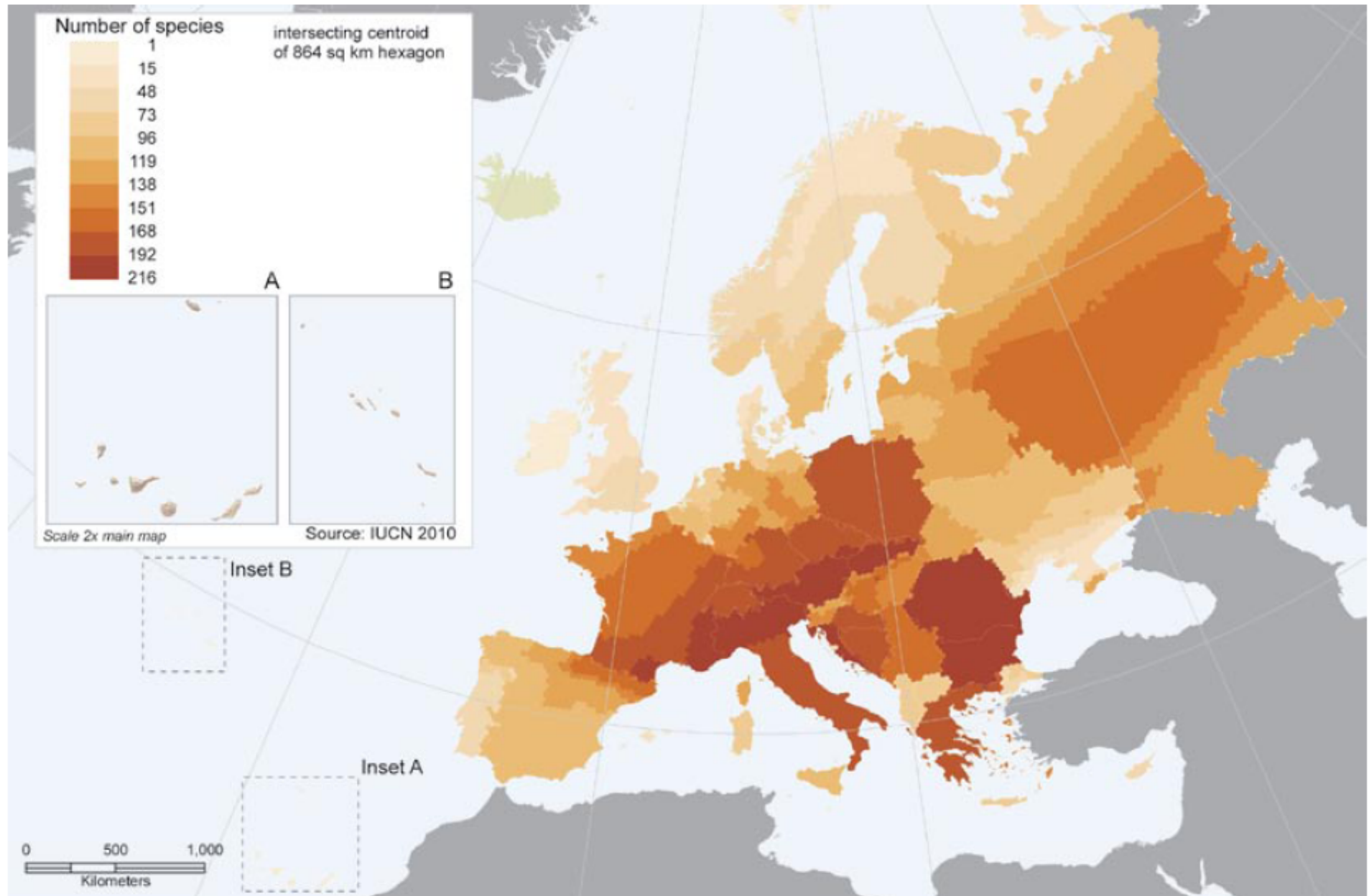




Table 6. Number of saproxylic beetle species in the 27 current EU Member States (excluding species classed as Not Applicable).

Country	Total number of species
Austria	215
Belgium	116
Bulgaria	213
Cyprus	56
Czech Republic	212
Denmark	89
Estonia	102
Finland	101
France	238
Germany	209
Greece	210
Hungary	206
Ireland	12
Italy	255
Latvia	127
Lithuania	107
Luxembourg	50
Malta	20
Netherlands	84
Poland	197
Portugal	104
Romania	209
Slovakia	227
Slovenia	142
Spain	224
Sweden	140
United Kingdom	78

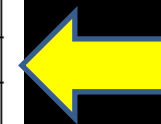
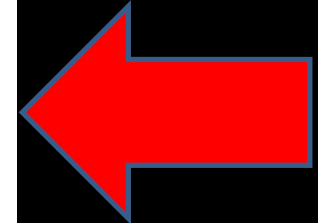
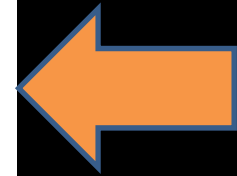


Figure 7. Distribution of endemic saproxylic beetles in Europe

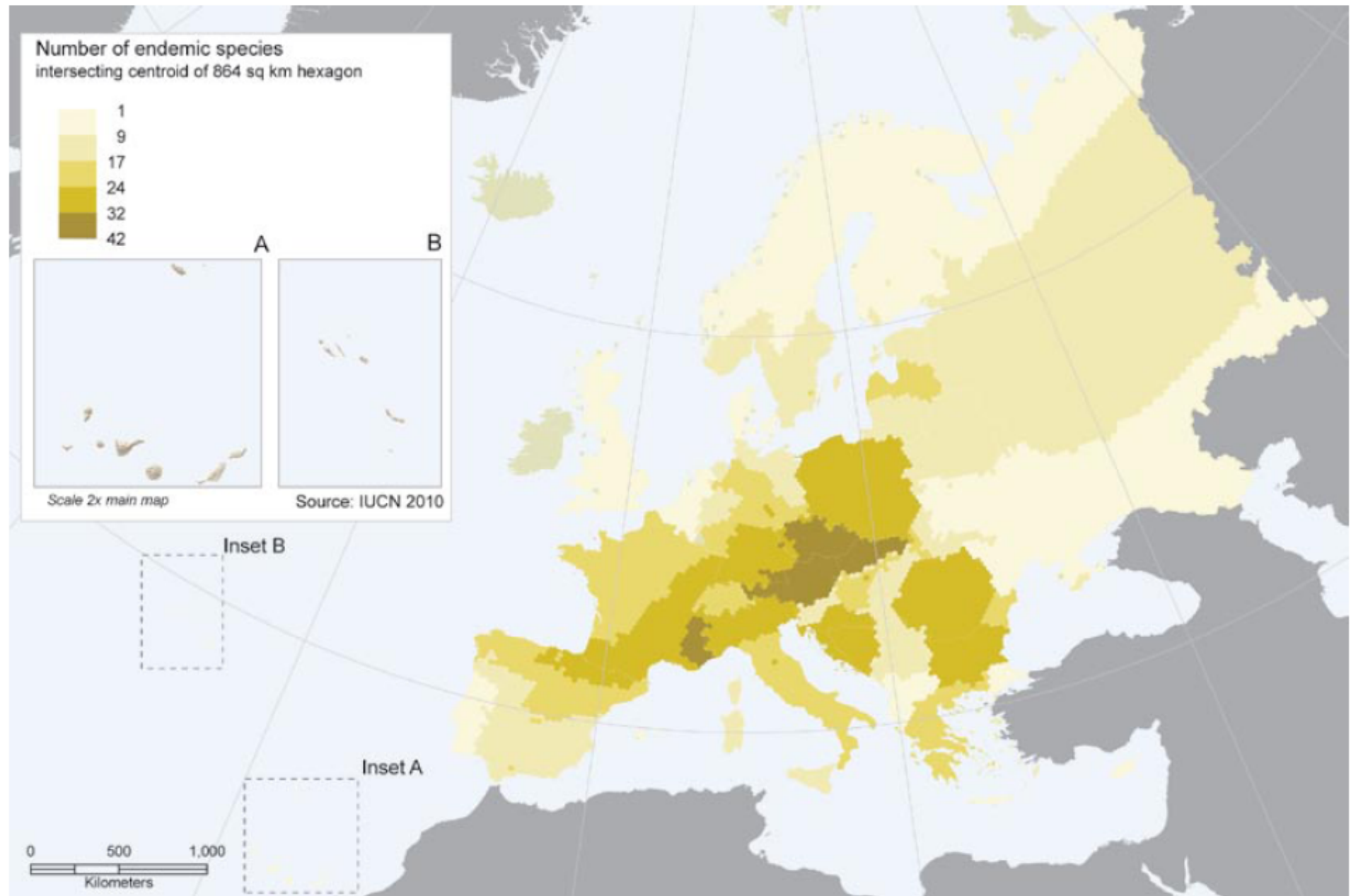


Table 3. Summary of numbers of selected saproxylic beetle species within each category of threat.

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
Threatened categories	Critically Endangered (CR)	2 (2)
	Endangered (EN)	27 (17)
	Vulnerable (VU)	17 (10)
Near Threatened (NT)	56 (22)	56 (11)
Least Concern (LC)	207 (30)	200 (6)
Data Deficient (DD)	122 (62)	94 (42)
Total number of species assessed*	431 (143)	407 (83)

* This table does not include the Not Applicable species in Europe and/or the EU (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) are also excluded.

Figure 3. Red List status of saproxylic beetles in Europe

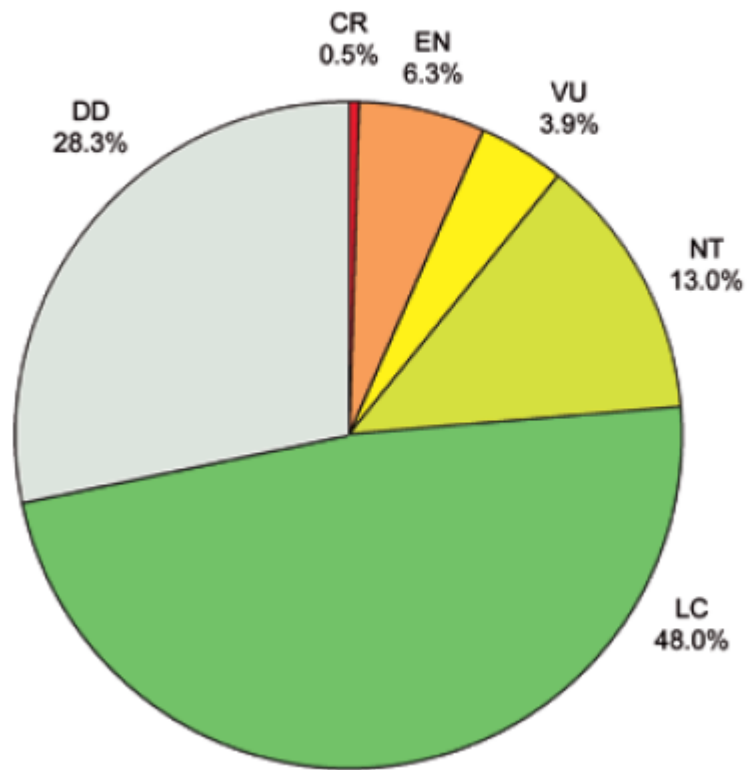


Figure 4. Red List status of saproxylic beetles in the EU

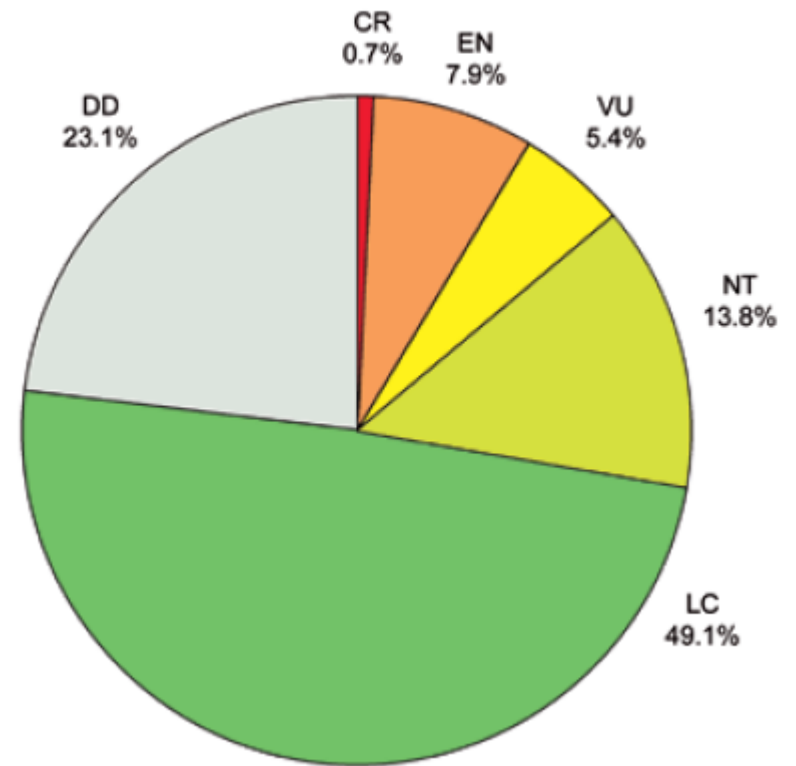


Table 5. Threatened saproxylic beetle species at the European and EU 27 level.

Family	Species	Red List status		Endemic to Europe?
		EU 27	Europe	
CERAMBYCIDAE	<i>Glaphyra bassettii</i>	CR	CR	Yes
EUCHIRIDAE	<i>Propomacrus cypricus</i>	CR	CR	Yes
CUCUJIDAE	<i>Cucujus haematodes</i>	CR	EN	
BUPRESTIDAE	<i>Buprestis splendens</i>	EN	EN	Yes
CERAMBYCIDAE	<i>Anaglyptus luteofasciatus</i>	EN	EN	Yes
CERAMBYCIDAE	<i>Anaglyptus praecellens</i>	EN	EN	Yes
CERAMBYCIDAE	<i>Calchaenesthes sexmaculata</i>	EN	EN	
CERAMBYCIDAE	<i>Callergates gaillardoti</i>	EN	EN	
CERAMBYCIDAE	<i>Chlorophorus convexifrons</i>	EN	EN	
CERAMBYCIDAE	<i>Crotchiella brachyptera</i>	EN	EN	Yes
CERAMBYCIDAE	<i>Isotomus jarmilae</i>	EN	EN	Yes
CERAMBYCIDAE	<i>Pseudosphegistes bergeri</i>	EN	EN	Yes
CERAMBYCIDAE	<i>Purpuricenus nudicollis</i>	EN	EN	
CERAMBYCIDAE	<i>Ropalopus ungaricus</i>	EN	EN	Yes
CERAMBYCIDAE	<i>Stenopterus creticus</i>	EN	EN	Yes
CERAMBYCIDAE	<i>Trichoferus bergeri</i>	EN	EN	Yes
CETONIIDAE	<i>Osmoderma cristinae</i>	EN	EN	Yes
CETONIIDAE	<i>Osmoderma italica</i>	EN	EN	Yes
CETONIIDAE	<i>Osmoderma lassallei</i>	EN	EN	Yes
ELATERIDAE	<i>Adelocera pygmaea</i>	EN	EN	
ELATERIDAE	<i>Ampedus assingi</i>	EN	EN	Yes
ELATERIDAE	<i>Ampedus quadrisignatus</i>	EN	EN	Yes
ELATERIDAE	<i>Limoniscus violaceus</i>	EN	EN	Yes
ELATERIDAE	<i>Podeonius acuticornis</i>	EN	EN	
ELATERIDAE	<i>Tetrigus cyprius</i>	EN	EN	
EROTYLIDAE	<i>Triplax lacordairii</i>	EN	EN	
EUCNEMIDAE	<i>Hylocharis cruentatus</i>	EN	EN	
LUCANIDAE	<i>Dorcus alexisi</i>	EN	EN	Yes
TROGOSITIDAE	<i>Leipaspis pinicola</i>	EN	EN	Yes
BORIDAE	<i>Boros schneideri</i>	EN	VU	
ELATERIDAE	<i>Lacon lepidopterus</i>	EN	NT	
ELATERIDAE	<i>Ampedus lepidus</i>	EN	DD	
EUCNEMIDAE	<i>Dirrhagofarsus attenuatus</i>	EN	DD	
PYTHIDAE	<i>Pytho kolwensis</i>	EN	DD	
RHYSODIDAE	<i>Rhysodes sulcatus</i>	EN	DD	

Table 5. Threatened saproxylic beetle species at the European and EU 27 level.

Family	Species	Red List status		Endemic to Europe?
		EU 27	Europe	
BOSTRICHIDAE	<i>Xylomedes cornifrons</i>	VU	VU	
CERAMBYCIDAE	<i>Clytus clavicornis</i>	VU	VU	Yes
CERAMBYCIDAE	<i>Clytus triangulimacula</i>	VU	VU	Yes
CERAMBYCIDAE	<i>Delagrangus angustissimus</i>	VU	VU	
CERAMBYCIDAE	<i>Delagrangus schurmanni</i>	VU	VU	Yes
CERAMBYCIDAE	<i>Isotomus barbarae</i>	VU	VU	Yes
CERAMBYCIDAE	<i>Stenopterus atricornis</i>	VU	VU	
CEROPHYTIDAE	<i>Cerophytum elateroides</i>	VU	VU	
CETONIIDAE	<i>Gnorimus decempunctatus</i>	VU	VU	Yes
CETONIIDAE	<i>Protaetia mirifica</i>	VU	VU	
ELATERIDAE	<i>Ampedus brunnicornis</i>	VU	VU	Yes
ELATERIDAE	<i>Ampedus hjorti</i>	VU	VU	Yes
ELATERIDAE	<i>Ischnodes sanguinicollis</i>	VU	VU	
EROTYLIDAE	<i>Triplax emgei</i>	VU	VU	Yes
EUCNEMIDAE	<i>Melasis fermini</i>	VU	VU	Yes
TROGOSITIDAE	<i>Leipaspis lauricola</i>	VU	VU	Yes
CERAMBYCIDAE	<i>Xylotrechus ibex</i>	VU	NT	
CETONIIDAE	<i>Gnorimus variabilis</i>	VU	NT	
ELATERIDAE	<i>Lacon querceus</i>	VU	NT	
EUCNEMIDAE	<i>Farsus dubius</i>	VU	NT	
LEIODIDAE	<i>Agathidium pulchellum</i>	VU	NT	Yes
LUCANIDAE	<i>Lucanus ibericus</i>	VU	DD	

Figure 9. Population trends of European saproxylic beetles

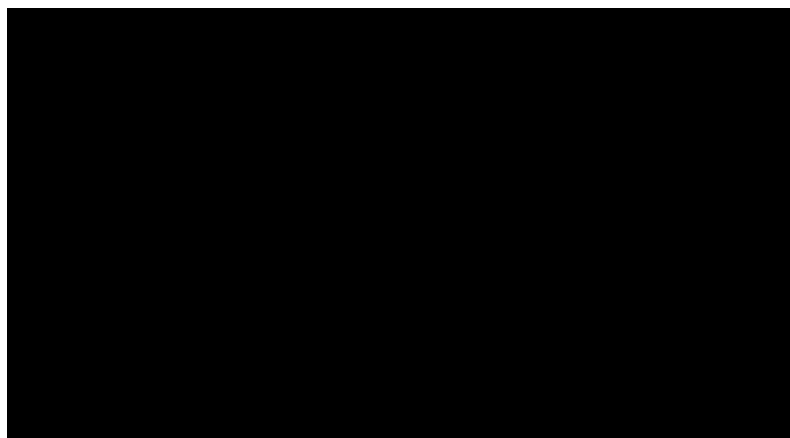
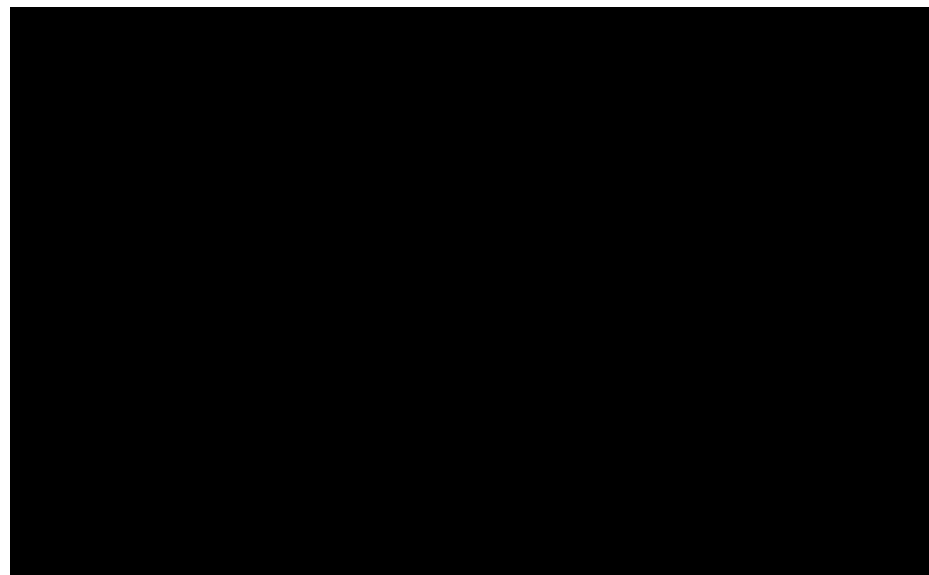
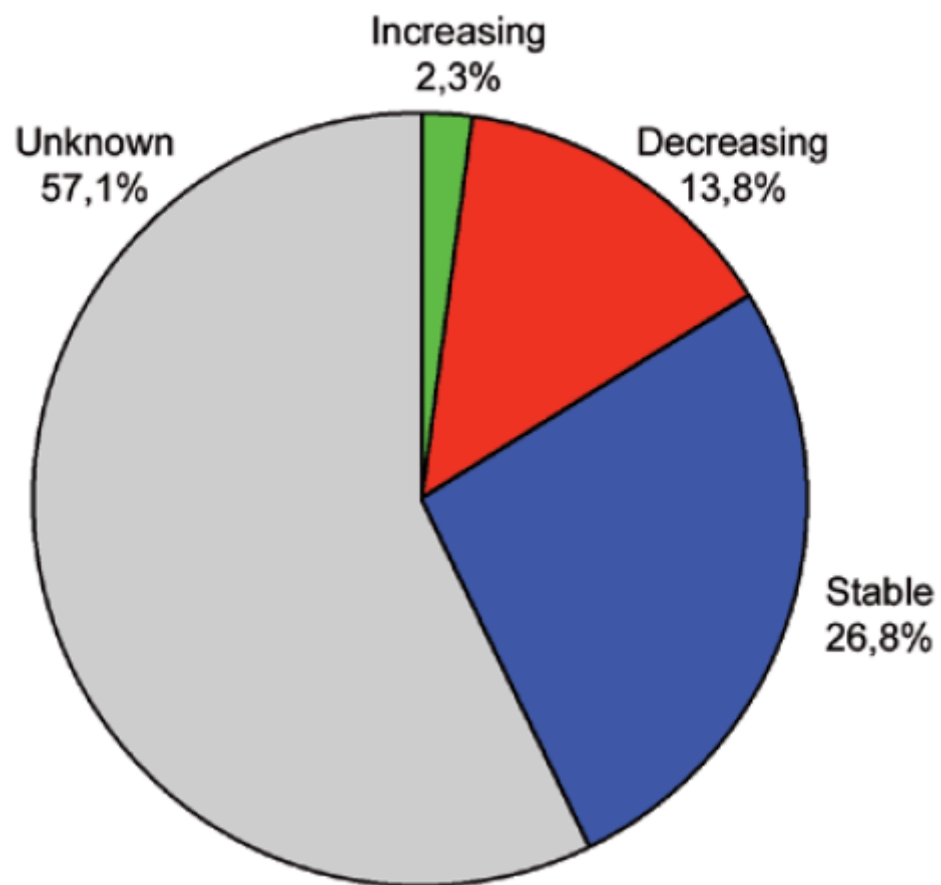


Figure 6. Distribution of threatened saproxylic beetles in Europe

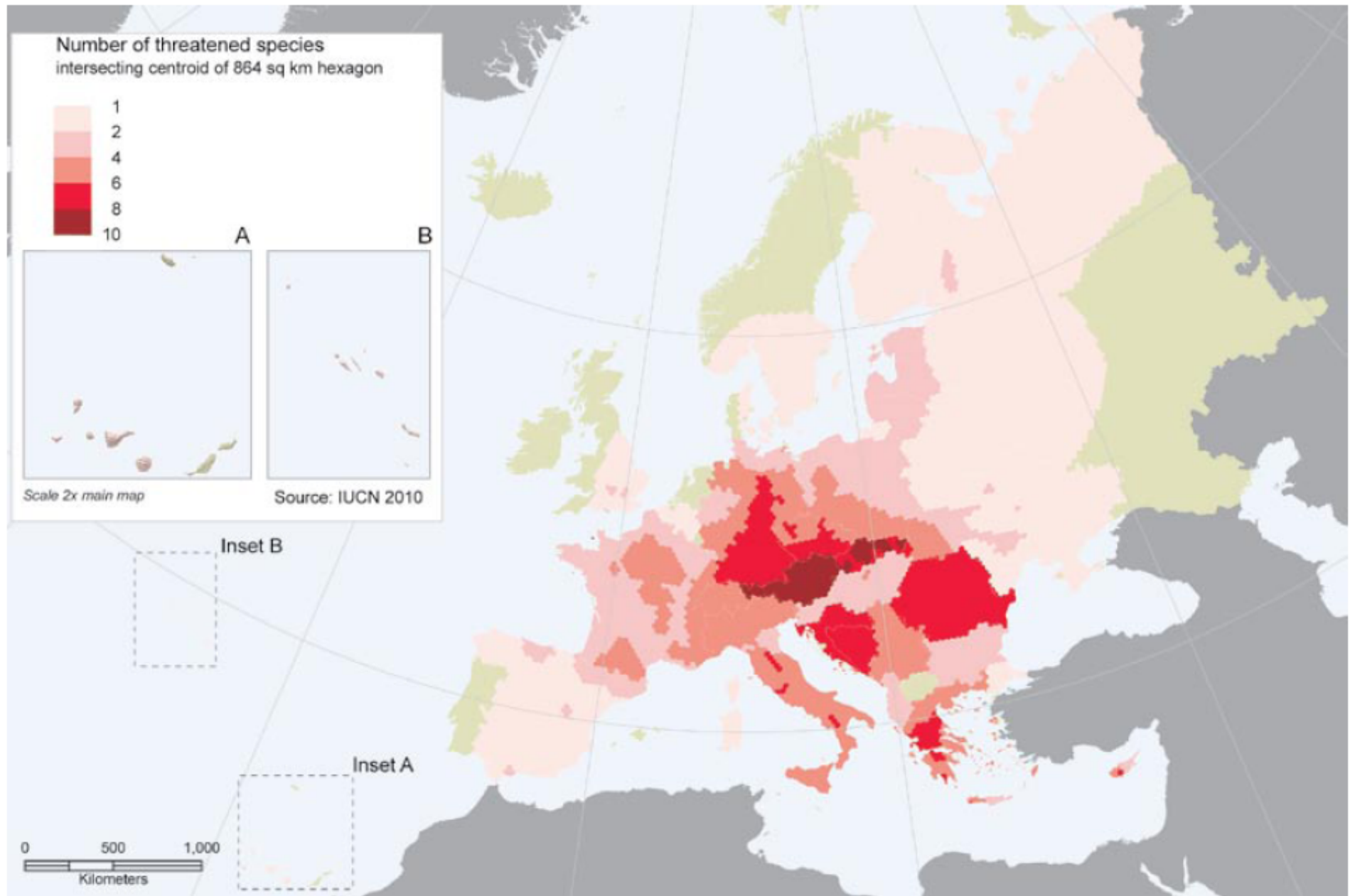


Figure 8. Major threats to saproxylic beetles in Europe

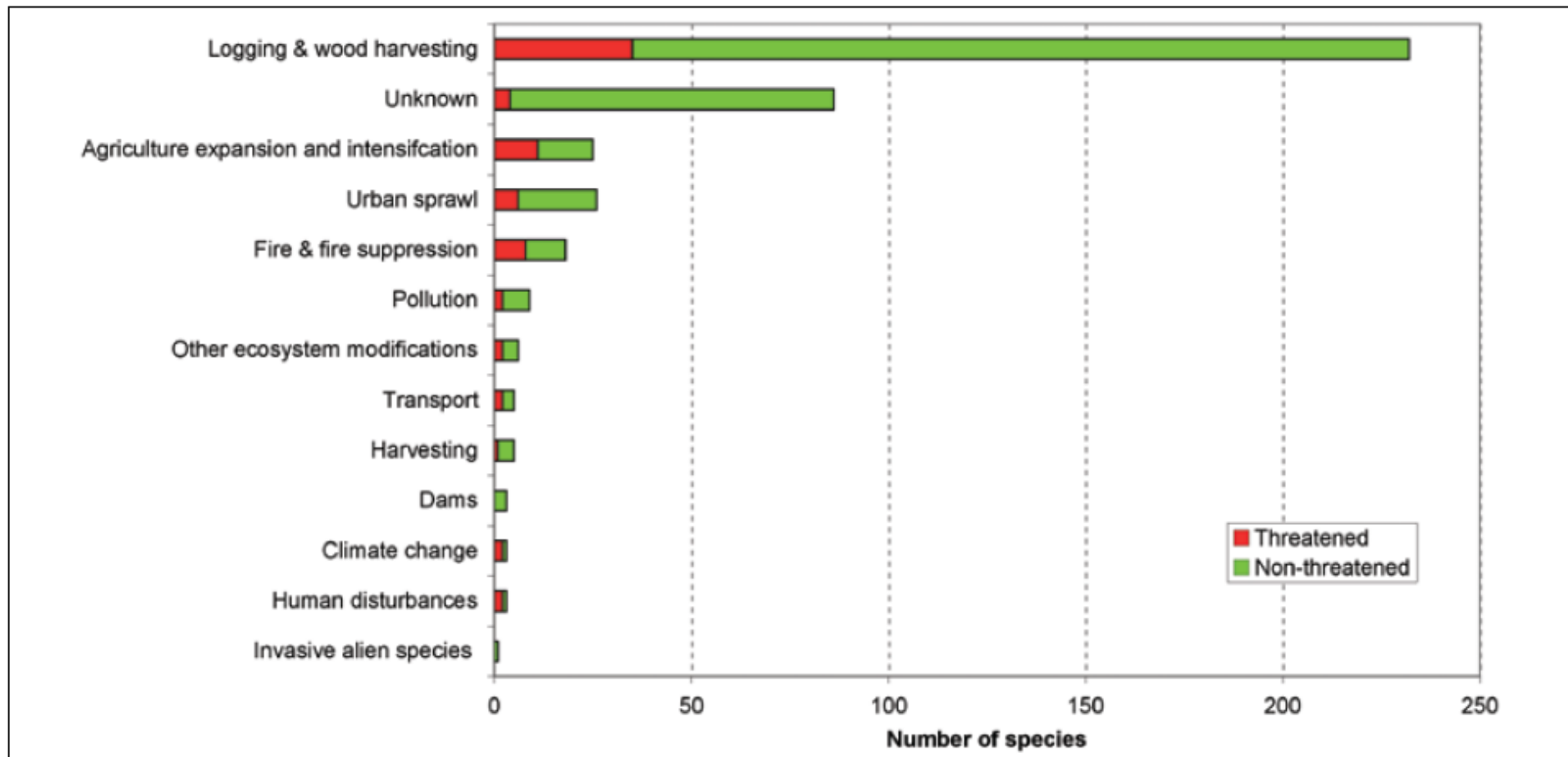


Table 7. The threatened saproxylic beetle taxa identified by the assessment and their presence on either Annexes II and IV of the Habitats Directive or Appendices II or III of the Bern Convention.

Family	Species	Red List status		Habitats Directive Annexes	Bern Convention Appendices
		EU 27	Europe		
CERAMBYCIDAE	<i>Glaphyra bassetii</i>	CR	CR		
EUCHIRIDAE	<i>Propomacrus cypriacus</i>	CR	CR	II/IV	
CUCUJIDAE	<i>Cucujus haematodes</i>	CR	EN		
BUPRESTIDAE	<i>Buprestis splendens</i>	EN	EN	II/IV	II
CERAMBYCIDAE	<i>Anaglyptus luteofasciatus</i>	EN	EN		
CERAMBYCIDAE	<i>Anaglyptus praecellens</i>	EN	EN		
CERAMBYCIDAE	<i>Calchaenesthes sexmaculata</i>	EN	EN		
CERAMBYCIDAE	<i>Callergates gaillardoti</i>	EN	EN		
CERAMBYCIDAE	<i>Chlorophorus convexifrons</i>	EN	EN		
CERAMBYCIDAE	<i>Crotchiella brachyptera</i>	EN	EN		
CERAMBYCIDAE	<i>Isotomus jarmilae</i>	EN	EN		
CERAMBYCIDAE	<i>Pseudosphegistes bergeri</i>	EN	EN		
CERAMBYCIDAE	<i>Purpuricenus nudicollis</i>	EN	EN		
CERAMBYCIDAE	<i>Ropalopus ungaricus</i>	EN	EN		
CERAMBYCIDAE	<i>Stenopterus creticus</i>	EN	EN		
CERAMBYCIDAE	<i>Trichoferus bergeri</i>	EN	EN		
CETONIIDAE	<i>Osmoderma cristinae</i>	EN	EN	II/IV ¹	II ¹
CETONIIDAE	<i>Osmoderma italica</i>	EN	EN	II/IV ¹	II ¹
CETONIIDAE	<i>Osmoderma lassallei</i>	EN	EN	II/IV ¹	II ¹
ELATERIDAE	<i>Adelocera pygmaea</i>	EN	EN		
ELATERIDAE	<i>Ampedus assingi</i>	EN	EN		
ELATERIDAE	<i>Ampedus quadrisignatus</i>	EN	EN		
ELATERIDAE	<i>Limoniscus violaceus</i>	EN	EN	II	
ELATERIDAE	<i>Podeonius acuticornis</i>	EN	EN		
ELATERIDAE	<i>Tetrigus cyprius</i>	EN	EN		
EROTYLIDAE	<i>Triplax lacordairii</i>	EN	EN		
EUCNEMIDAE	<i>Hylochaeres cruentatus</i>	EN	EN		
LUCANIDAE	<i>Dorcus alexisi</i>	EN	EN		
TROGOSITIDAE	<i>Leipaspis pinicola</i>	EN	EN		
BORIDAE	<i>Boros schneideri</i>	EN	VU	II	
ELATERIDAE	<i>Lacon lepidopterus</i>	EN	NT		
ELATERIDAE	<i>Ampedus lepidus</i>	EN	DD		
EUCNEMIDAE	<i>Dirrbagofarsus attenuatus</i>	EN	DD		
PYTHIDAE	<i>Pytho kolwensis</i>	EN	DD	II/IV	
RHYSODIDAE	<i>Rhysodes sulcatus</i>	EN	DD	II	
BOSTRICHIDAE	<i>Xylomedes cornifrons</i>	VU	VU		
CERAMBYCIDAE	<i>Clytus clavicornis</i>	VU	VU		
CERAMBYCIDAE	<i>Clytus triangulimacula</i>	VU	VU		
CERAMBYCIDAE	<i>Delagrangeus angustissimus</i>	VU	VU		
CERAMBYCIDAE	<i>Delagrangeus schurmanni</i>	VU	VU		

Family	Species	Red List status		Habitats Directive Annexes	Bern Convention Appendices
		EU 27	Europe		
CERAMBYCIDAE	<i>Isotomus barbarae</i>	VU	VU		
CERAMBYCIDAE	<i>Stenopterus atricornis</i>	VU	VU		
CEROPHYTIDAE	<i>Cerophytum elateroides</i>	VU	VU		
CETONIIDAE	<i>Gnorimus decempunctatus</i>	VU	VU		
CETONIIDAE	<i>Protaetia mirifica</i>	VU	VU		
ELATERIDAE	<i>Ampedus brunnicornis</i>	VU	VU		
ELATERIDAE	<i>Ampedus hjorti</i>	VU	VU		
ELATERIDAE	<i>Ischnodes sanguinicollis</i>	VU	VU		
EROTYLIDAE	<i>Triplax emgei</i>	VU	VU		
EUCNEMIDAE	<i>Melasis fermini</i>	VU	VU		
TROGOSITIDAE	<i>Leipaspis lauricola</i>	VU	VU		
CERAMBYCIDAE	<i>Xylotrechus ibex</i>	VU	NT		
CETONIIDAE	<i>Gnorimus variabilis</i>	VU	NT		
ELATERIDAE	<i>Lacon querceus</i>	VU	NT		
EUCNEMIDAE	<i>Farsus dubius</i>	VU	NT		
LEIODIDAE	<i>Agathidium pulchellum</i>	VU	NT	II	
LUCANIDAE	<i>Lucanus ibericus</i>	VU	DD		

1 As part of *Osmoderma eremita*



Table 8. The number of LIFE projects targeted either towards specific species or habitats for saproxylic beetles. This review is based on a search for arthropod species on the LIFE database <http://ec.europa.eu/environment/life/project/Projects/index.cfm>. Some projects target more than one species. Most of the 20 projects were focused at the habitat or site level rather than on particular species.

Species	Projects
<i>Osmoderma eremita</i>	1
<i>Cerambyx cerdo</i>	1
<i>Lucanus cervus</i>	1
Habitats	
Habitats and sites for saproxylic beetles	18



CONCLUSIONS

- Saproxyllic beetles play an important role in **decomposition processes** and thus for nutrient cycling in natural ecosystems. Many are also involved in pollination.
- **Much is left to learn** about the saproxyllic beetles of Europe. The knowledge of the biology and therefore the status of many species is still largely insufficient.
- Many saproxyllic beetle species remain widely distributed in Europe, although their **populations and ranges have suffered significant long-term decline**.



CONCLUSIONS

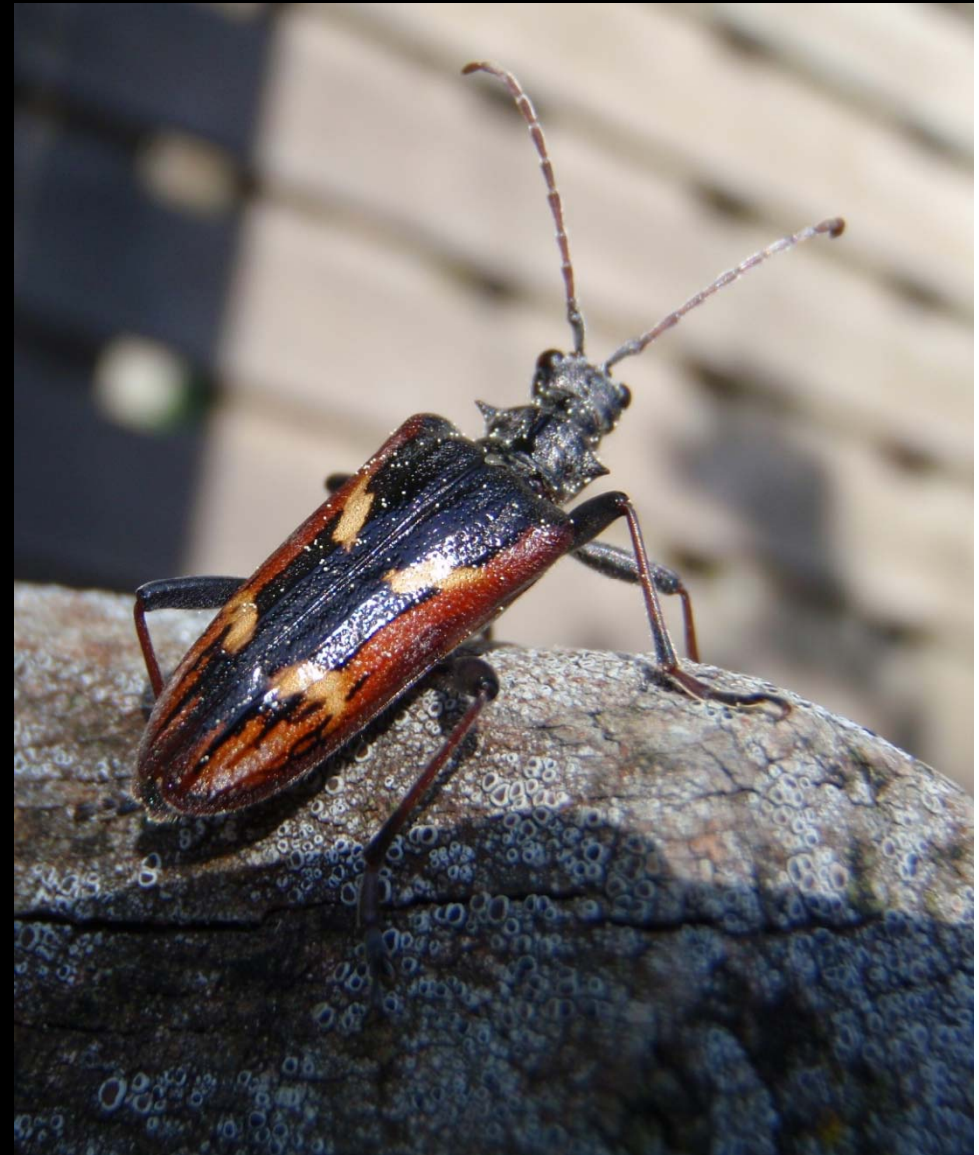
- The main long-term threats identified are **habitat loss in relation to logging and wood harvesting** and the decline of veteran trees throughout the landscape, as well as lack of land management targeted at promotion of recruitment of new generations of trees. More short-term and localised threats arise from **sanitation and removal of old trees** due to (often misconceived) safety constraints, in places heavily used by people.



CONCLUSIONS

- Few European countries - if any - have any kind of **organised and systematic monitoring** for saproxylic beetle species. There is a clear **need for drawing together information on all initiatives** under way or planned, and for a wider European saproxylic beetle conservation action plan to be explored, developed, and undertaken.

- **Raising awareness** among conservation professionals and resources managers about the needs of saproxylic organisms is crucial, as they depend on the dynamics of tree aging and wood decay processes, which in turn have implications for land management – nonintervention or minimum intervention in former wood pasture can prevent the renewal of old trees and be very damaging and **livestock grazing can be essential** to maintain adequate habitats.



CONCLUSIONS

- Historical continuity of suitable **veteran trees** is also important but this is **not addressed yet by the EU Habitats Directive** process and there is an urgent need of attention.
- This new analysis of the European threat status of the selected saproxylic beetles will provide an **important resource** for when the current lists on the **Habitats Directive Annexes** and on the Bern Convention Appendices are next reviewed.
- The taxonomic coverage of this **Red List requires expanding** as only a small proportion of Europe's saproxylic beetles have been assessed.



European Red List of Dragonflies

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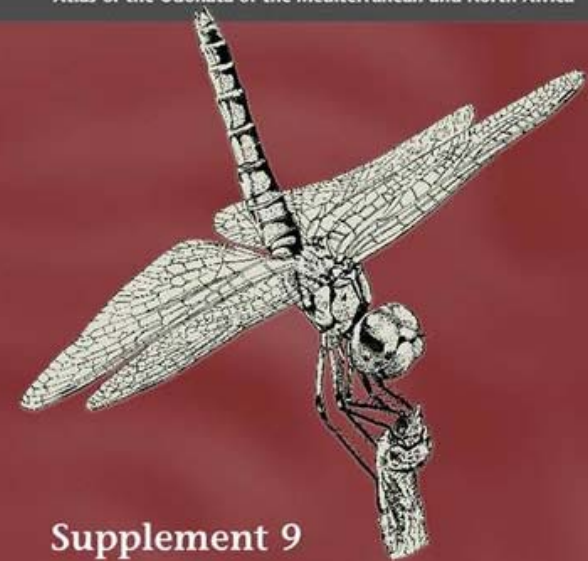
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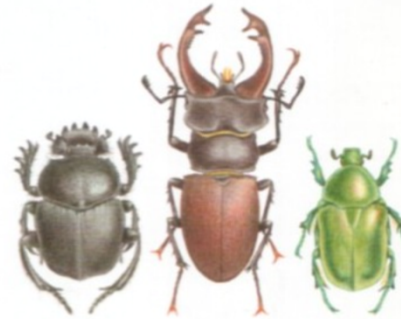


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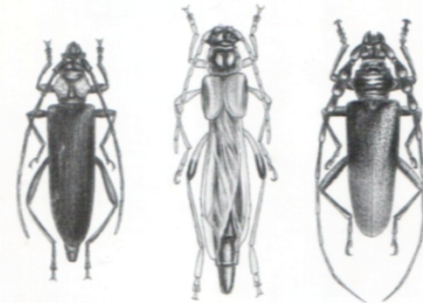
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