ENTOMOLOGIE, 78: 113-131, 2008

An updated Red List of the ground and tiger beetles (Coleoptera, Carabidae) in Flanders (Belgium)

By Konjev DESENDER†, Wouter DEKONINCK and Dirk MAES

Abstract

An analysis of the long term dynamics of ground and tiger beetles in Flanders permitted to update the first documented Red List of 1995. During the past 10 years, the number of records on these beetles nearly doubled, mainly because of several large scale regional studies and monitoring projects.
The compilation of this new Red List of carabid beetles in Flanders is mainly based on two criteria: a trend criterion (degree of decline) and a rarity criterion (actual distribution area). For some species occurring in one or only a few small and strongly isolated populations and/or species that are threatened because they are only found in one particularly threatened habitat or because they are constantly brachypterous (wingless), a third criterion best professional judgement, is additionally used.
To update the previous Red List, we now adopted 1980 as pivot point (instead of 1950), because this permitted to detect more recent changes in distribution. We also changed from the usual 10 km x 10 km UTM grid cells to 5 km x 5 km UTM grid cells. However, due to some differences in mapping intensity in the two compared periods, a straightforward comparison of the number of grid cells in which each species was recorded, appears inappropriate and therefore a correction factor is used.
A list is compiled of all species, including those new for Flanders (since 1980), as well as those that have disappeared (no more records since 1980). We discuss the number of carabid species found in the two periods and give comments on rarity and trends in species distributions. Of the 382 species ever recorded in Flanders, 35% appear to be threatened at this moment in one way or another and their distribution is clearly linked to a number of severely threatened habitats.

Key words: Red List, Flanders, Carabidae.

Samenvatting

Een analyse van de dynamiek op lange termijn van loopkevers en zandloopkevers in Vlaanderen stelde ons in staat om de in 1995 verschenen Rode Lijst te actualiseren. Gedurende de voorbije 10 jaar is het aantal waarnemingen van deze kevers in Vlaanderen bijna verdubbeld, dankzij diverse grootschalige regionale ecologische studies en monitoring-projecten.
De compilatie van deze nieuwe Rode Lijst van Carabidae in Vlaanderen steunt in hoofdzaak op twee criteria: een trend-criterium (mate van verandering in verspreiding) en een zeldzaamheids-criterium (actueel verspreidingsgebied). Voor enkele soorten die alleen in één of enkele kleine en sterk geïsoleerde populaties voorkomen of die bedreigd zijn omdat ze uitsluitend gevonden worden in één bijzonder habitat of omdat deze soorten altijd brachypteer (vleugelloos) zijn werd ook een derde criterium gebruikt: "best professional judgement".
Om een update van de vorige Rode Lijst te realiseren gaan we nu uit van het jaar 1980 als kanteldatum (in plaats van 1950) om een nieuwe analyse en Rode Lijst te verwezenlijken. Dit laat ons toe om de recentere veranderingen in het verspreidingsgebied van de verschillende soorten te achterhalen. Tevens schakelden we over van 10 km x 10 km UTM hokken naar 5 km x 5 km UTM hokken. Verschillen in kaartbedekking en bemonsteringsintensiteit tussen de tijdsperiodes verhinderen echter een directe vergelijking tussen het aantal UTM-hokken waarin iedere soort werd aangetroffen en daarom maken we gebruik van een correctiefactor.
Een lijst van alle soorten wordt voorgesteld, inclusief soorten nieuw voor Vlaanderen (sedert 1980) en soorten die verdwenen zijn (geen records meer sedert 1980). We bespreken het totale aantal loopkevers en zandloopkevers gevonden gedurende beide tijdsperiodes, en geven commentaren bij de zeldzaamheid, trends en soortdistributies. De nieuwe, volledig aangepaste, Rode Lijst van loopkevers en zandloopkevers in Vlaanderen wordt volledig weergegeven. Van de 382 soorten die ooit in Vlaanderen werden vastgesteld, blijkt niet minder dan bijna 35% momenteel op de één of andere manier bedreigd. De verspreiding van heel wat van die soorten is duidelijk in verband te brengen met hun voorkomen in een aantal ernstig bedreigde habitats.

Sleutelwoorden: Rode Lijst, Vlaanderen, Carabidae.

Introduction

Ground and tiger beetles (Coleoptera, Carabidae) belong to the most popular, diverse and best studied

† Konjev Desender passed away during the writing of this publication. We sincerely thank him for all the knowledge and enthusiasm he passed on to us and many other coleopterists in Belgium and elsewhere during the many years of collaboration.

invertebrates of Flanders. Their study started around the middle of the 19th century and has been continued more or less intensively ever since. One of the first detailed compilations of distribution maps on invertebrates in Belgium dealt with representatives of this beetle family (DESENDER, 1986a-d). In 1995, an analysis of the long term dynamics of these beetles permitted the publication of the first documented Red List of threatened Carabidae in Flanders (DESENDER *et al.*, 1995).

During the last 10 years, the number of records of carabid beetles in Flanders has nearly doubled, mainly because of several large scale regional projects. This urged the need of a re-analysis of their long term dynamics in this region and permitted a first update of the previous documented Red List (1995) of ground and tiger beetles threatened in Flanders. To this end, a new database was constructed. The new database counts almost 200,000 records (record = species/date/locality) of ground and tiger beetles in Belgium. So far 404 species are known from Belgium and 382 of them have been found in Flanders. New distribution maps of all 404 species were made and are published elsewhere (DESENDER *et al.*, 2008).

This is the second detailed update of a Red List in Flanders. The first update of a Red List in Flanders was for the Odonata in 2006 (DE KNIJF *et al.*, 2006). It has been suggested to reconsider updates of red lists using new data regularly (DUELLI, 1994; HOOGEVEEN, 1998) some even suggest to do so each ten years (MAES & VAN SWAAY, 1997; DEKONINCK *et al.*, 2005; GRUTTKE & HAUPT, 2005).

A list of all new Carabidae for Flanders as well as all species that have disappeared (no more records since 1980) is presented by DEKONINCK & DESENDER (2007), who also discuss the number of records and species found in the two time periods and give comments on rarity and trends in distribution of most species.

Material and methods

Study area and used UTM-grid

To construct a new database we converted all records to 664, 5 km x 5 km UTM grid cells, hereafter simply called grid cells, at least partly situated in Flanders (the northern part of Belgium).

Origin of the data

At the Entomology Department of the Royal Belgian Institute of Natural Sciences (RBINS) all Belgian records of Carabidae (including Cicindelid beetles) have been continuously verified and centralized into a database with at present more than 200,000 historical as well as very recent records. Records are now stored at least in the following format (species/date/locality/grid cell).

Hand sampling: Not only in the past, but also more recently, carabid beetles appear to be a very popular group amongst beetle collectors. The last 20 years a lot of records were generated from hand sampling all over the country.

Literature: During the period 1881 and 1890 Alfred Preudhomme de Borre published 31 papers with lists of records of Carabidae per Belgian Province. These literature records generated about 6650 records from 301 species in 87 grid cells. Doubtful species without reference material from that time period, were omitted from these records.

Pitfall trapping: The last 10 years a large amount of data has been gathered by pitfall sampling, mainly during several large scale regional projects performed by the Dept. of Entomology Department of the RBINS, the Research Institute for Nature and Forest (INBO), Aeolus-Arcadis and Terrestrial Ecology Unit of the Ghent University.

Light traps: For some very rare species, recent records were obtained by light traps.

Collections: The most important old carabid collections (Derenne, Guilleaume, Jacobs, Hanssen,....) are conserved at RBINS and all have been verified by the first author. Moreover, formerly unidentified supplements were now also completely checked and added to the records. A lot of private collections and collections at other institutes were also screened and/or (re)identified.

Records from the Dutch border: From the Dutch carabid database, we could add records from grid cells that are partly located in Belgium and the Netherlands. In total, 9000 records from 298 species from 50 grid cells were added in this way.

Data analysis and basic statistics used

The compilation of the new Red List of Carabid beetles in Flanders was based on two criteria: a trend criterion (degree of decline) and a rarity criterion (actual distribution area). To update the first Red List we fixed 1980 as pivot point because this permitted us to detect the more recent changes in the distribution of carbid beetles in Flanders. Additionally, the number of records was approximately equal before and after this time period. However due to a difference in mapping intensity in the two compared periods, a straightforward comparison of the number of grid cells in which each species was recorded, appeared inappropriate. We defined an occurrence as the presence of a species in a grid cell in a time period.

Table 1 – Red List categories as a combination of the trend and the rarity (1=Critically Endangered, 2a and 2b=Endangered; 3a and 3b=Vulnerable; 4a, 4b and 4c=Susceptible; 5a and 5b=Near Threatened; Su=Susceptible, NT=Near threatened, S=safe and LR=Low Risk)

RARITY Number of grid cells						TREND
0-15	16-31	32-63	64-127	128-256	>256	
% of grid cells						
<3.125% very rare	3.125-6.25% rare	6.25-12.5% rather rare	12.5-25% rather common	25-50% common	>=50% very common	
1	2a	3a	5a/NT1	5b/NT2	5c/NT3	-80%
2b	2b*	3a	5a/NT1	5b/NT2	S/LR	-50 -80%
3b	3b*	3a	5a/NT1	S/LR	S/LR	-30 -50%
4a/Su1	4b/Su2	4c/Su3	S/LR	S/LR	S/LR	-30 +30%
4a/Su1	4b/Su2	4c/Su3	S/LR	S/LR	S/LR	+30 +50%
4a/Su1	4b/Su2	S/LR	S/LR	S/LR	S/LR	+50 +80%
4a/Su1	S/LR	S/LR	S/LR	S/LR	S/LR	+80%

The degree of change (trend) was calculated by:

TREND= [per2 – (per1 * COR)] / [(per1 * COR) + per2]

where per1 and per2 are the number of grid cells per species in period 1 (before 1980) and period 2 (from 1980) respectively and COR the correction factor to correct for difference in mapping intensity in both periods: total number of occurrences per species in period 2 divided by total number of occurrences per species in period 1. Here the correction factor was 19,510/16,566 = 1.178 generating for each species a TREND value between -1 (extinct) and +1 (new for Flanders). This analysis was adopted earlier by DUFRENE & DESENDER (2007).

The combinations of the degree of change (trend) and rarity (relative presence in all sampled squares in period 2 (n=512)) result in the classification into the different Red List categories (Table 1).

Categories (after IUCN categories)

For some species occurring in one or only a few small and strongly isolated populations and/or species that are threatened because they are only found in one particularly threatened habitat or because they are constantly brachypterous (category 1b and 2c), we classified them into a Red List category based on best professional judgement.

Category 0: Extinct in the Wild (Uitgestorven in Vlaanderen U)

Species no longer located in the wild with all records before 1980. We assume that these species had at least one vital population before 1980 in Flanders.

Criterion:

0: species without recent populations in Flanders (n=36).

Category 1: Critically Endangered (Met uitsterven bedreigd MUB)

Species that have a high probability to go extinct in Flanders in the near future, if specific measures to protect the species and its habitat are not taken.

Criteria:

1a: species with a decline of at least 80% and occurring in less than 3.125% or less than 16 grid cells (n=14);

1b: species occurring in one or only a few small and strongly isolated populations and/or species that are critically endangered because they are constantly brachypterous (wingless) and present only in one or a few relic populations (n=17).

Category 2: Endangered (Bedreigd B)

Species that have a high probability to become critically endangered or extinct in the near future if species-specific measures to protect them and their habitat are not taken.

Criteria:

2a: species with a decline of at least 80% and occurring in 3.125-6.25% or 16-31 of the sampled Flemish grid cells (n=0);

2b - 2b* : species with a decline of 50-80% and occurring in less than 6,25 % or less than 32 of the sampled Flemish grid cells (n=27 + 5);

2c: species occurring in one or only a few small and strongly isolated populations and/or species that are critically endangered because they

are only found in one particularly threatened habitat (n=2).

Category 3: Vulnerable (Kwetsbaar K)

Species that have a high probability to become Endangered in the near future if species-specific measures to protect them and their habitat are not taken.

Criteria:

3a: species with a decline of > 80% or 50-80% or 30-50% and occurring in 6.25-12.5 % or 32-63 of the sampled Flemish grid cells (n=3);

3b: species with a decline of 30-50% and occurring in less than 3,125 or less than 16 of the sampled Flemish grid cells (n=19);

3b* species with a decline of 30-50% and occurring in less than 3.125-6.25% or 16–31 of the sampled Flemish grid cells (n=10).

Category 4: Susceptible (Zeldzaam Z)

Species whit a small decline or a positive trend (increase) but occurring in only very few grid cells.

Criteria:

4a/Su1: species with a decline of -30/+30% or higher and occurring in less than < 3.125% or less than 15 of the sampled Flemish grid cells (n=48);

4b/Su2: species with a decline of -30/+75 and occurring in 3.125-6.25% or 16-32 of the sampled Flemish grid cells (n=32);

4c/Su3: species with a decline of -30/+50 and occurring in 6.25-12.5% or 32-63 of the sampled Flemish grid cells (n=47).

Category 5: Near-Threatened (Achteruitgaand A)

Species with a rather sharp decline but still occurring in a relatively high number of grid cells.

Criteria:

5a/NT1: species with a decline of >80%, 50-80% en 30-50% and occurring in 12.5-25 % or 64-127 of the sampled Flemish grid cells (n=2);

5b/NT2: species with a decline of >80% or 50-80% and occurring in 30-50% or 128-256 of the sampled grid cells (n=0);

5c/NT3: species with a decline of >80% and occurring in >50% or 256 of the sampled Flemish grid cells (n=0).

Category 6: Safe/Low risk (Momenteel niet bedreigd MNB)

Species with only a small decline or a positive trend or occurring in a relatively large number of the sampled Flemish grid cells (n=104).

Category ?: Insufficiently known (onvoldoende gekend ?)

Species that can not be attributed to one of the above categories because of lack of knowledge on distribution or because the knowledge we have on their distribution is doubtful. This does not imply that such species would not be threatened.

Criteria:

? a: species mentioned to have occurred in Flanders but with doubtful information only, or with only one or a few doubtful records and probably no vital populations (n=9);

? b: species that were probably one or several times accidentally introduced (n=2).

New (Nieuw)

Species without records before 1980 and which are known from one or a few populations in Flanders at this moment. This does not imply that such species would not be threatened (n=5).

Results

General results and diversity hotspots

Actually 404 species of Carabidae are known from Belgium, 382 of which have been recorded in Flanders. From 1820 until now records are available from 590 or 91.61% of the 644 Flemish 5 km x 5km UTM grid cells. In 1995, we counted 401 species in Belgium. *Bembidion nigropiceum* (Nieuwpoort, cf. DESENDER, 2005), *Polystichus connexus* (Lessive, leg. Delwaide 2003 and Heusden-Zolder, leg. Stassen, 2001 cf. STASSEN, 2002) and *Bembidion striatum* (Mol Zilvermeer; leg. Delwaide 2004) were recently added to the Belgian checklist.

Before 1980, we possess data for Flanders on 373 species in 516 grid cells. Since 1980, we have records from 510 grid cells and 336 species. In Fig. 1 the number of species per grid cells in both periods are given. Before 1980, the highest carabid diversity were situated near the big cities Brussels, Antwerp and Ghent, along the Belgian coast and along the river Meuse (boarder with the Netherlands). Since 1980 these are more randomly distributed over Flanders, suggesting more random sampling because of easier accessibility of most sites.

The Updated Red List

The Red List IUCN category (and criteria), the number

Table 2 – Red List IUCN category (and criteria), the number of grid cells with records of the species before and after 1980, the decline for each species and its habitat preference.

Species	Red List 2007	Category	<1980	>1980	Decline	Habitat	Rode Lijst 2007
Abax ater (Villers, 1789)	Safe/Low Risk	S/LR	71	139	0,2490	FO(E)	Momenteel niet bedreigd
Abax carinatus (Duftschmid, 1812)	Critically Endangered	1b	0	1	1,0000	FO(S)	Met uitsterven bedreigd
Abax ovalis (Duftschmid, 1812)	Susceptible	4a/Su1	11	13	0,0020	FO(S)	Zeldzaam
Abax parallelus (Duftschmid, 1812)	Susceptible	4b/Su2	24	29	0,0131	FO(S)	Zeldzaam
Acupalpus brunnipes (Sturm, 1825)	Susceptible	4c/Su3	59	56	-0,1072	HB	Zeldzaam
Acupalpus consputus (Duftschmid, 1812)	Susceptible	4c/Su3	53	38	-0,2429	M ESW(E)	Zeldzaam
Acupalpus dubius Schilsky, 1888	Safe/Low Risk	S/LR	53	129	0,3480	M ESW(E)	Momenteel niet bedreigd
Acupalpus exiguus (Dejean, 1829)	Vulnerable	3b	25	11	-0,4558	M ESW(E)	Kwetsbaar
Acupalpus flavicollis (Sturm, 1825)	Safe/Low Risk	S/LR	73	86	0,0004	MG(E)	Momenteel niet bedreigd
Acupalpus meridianus (Linnaeus, 1767)	Safe/Low Risk	S/LR	100	75	-0,2216	DG(E)	Momenteel niet bedreigd
Acupalpus parvulus (Sturm, 1825)	Safe/Low Risk	S/LR	100	109	-0,0384	OSW	Momenteel niet bedreigd
Acupalpus transversalis (Schaum, 1862)	Insufficiently known	?a	1	0	-1,0000	RB	Onvoldoende gekend
Aepus marinus (Stroem, 1768)	Extinct	0	3	0	-1,0000	SM	Uitgestorven
Agonum (*Anchomenus*) *dorsale* (Pontoppidan, 1763)	Safe/Low Risk	S/LR	136	197	0,1034	RA(E)	Momenteel niet bedreigd
Agonum (*Limodromus*) *assimile* (Paykull, 1790)	Safe/Low Risk	S/LR	119	185	0,1382	FO(E)	Momenteel niet bedreigd
Agonum (*Oxypselaphus*) *obscurum* (Herbst, 1784)	Safe/Low Risk	S/LR	119	203	0,1834	MG(E)	Momenteel niet bedreigd
Agonum (*Paranchus*) *albipes* (Fabricius, 1796)	Safe/Low Risk	S/LR	122	141	-0,0092	M ESW(E)	Momenteel niet bedreigd
Agonum (*Platynus*) *livens* (Gyllenhal, 1810)	Susceptible	4b/Su2	32	21	-0,2841	FO(S)	Zeldzaam
Agonum dolens (C.R. Sahlberg, 1827)	Extinct	0	2	0	-1,0000	OSW	Uitgestorven
Agonum ericeti (Panzer, 1809)	Critically Endangered	1b	2	2	-0,0814	HB	Met uitsterven bedreigd
Agonum fuliginosum (Panzer, 1809)	Safe/Low Risk	S/LR	110	173	0,1439	MG(E)	Momenteel niet bedreigd
Agonum gracile (Gyllenhal, 1827)	Susceptible	4b/Su2	38	27	-0,2472	OSW	Zeldzaam
Agonum gracilipes (Duftschmid, 1812)	Critically Endangered	1b	5	1	-0,7095	DG(S)	Met uitsterven bedreigd
Agonum lugens (Duftschmid, 1812)	Extinct	0	3	0	-1,0000	M ESW(E)	Uitgestorven
Agonum marginatum (Linnaeus, 1758)	Safe/Low Risk	S/LR	89	125	0,0881	OSW	Momenteel niet bedreigd
Agonum micans (Nicolai, 1822)	Susceptible	4c/Su3	40	46	-0,0117	RB	Zeldzaam
Agonum moestum (*afrum*) (Duftschmid, 1812)	Safe/Low Risk	S/LR	109	163	0,1191	M ESW(E)	Momenteel niet bedreigd
Agonum muelleri (Herbst, 1785)	Safe/Low Risk	S/LR	139	236	0,1811	DG(E)	Momenteel niet bedreigd
Agonum nigrum Dejean, 1828	Susceptible	4c/Su3	23	32	0,0834	MG(E)	Zeldzaam
Agonum piceum (Linnaeus, 1758)	Endangered	2b	17	4	-0,6668	M ESW(E)	Bedreigd
Agonum scitulum Dejean, 1828	Extinct	0	7	0	-1,0000	M ESW(E)	Uitgestorven
Agonum sexpunctatum (Linnaeus, 1758)	Safe/Low Risk	S/LR	120	112	-0,1155	DG(S)	Momenteel niet bedreigd
Agonum thoreyi Dejean, 1828	Safe/Low Risk	S/LR	73	85	-0,0055	M ESW(E)	Momenteel niet bedreigd
Agonum versutum (Gyllenhal, 1827)	Susceptible	4b/Su2	29	23	-0,1949	OSW	Zeldzaam
Agonum viduum (Panzer, 1797)	Safe/Low Risk	S/LR	82	131	0,1515	M ESW(E)	Momenteel niet bedreigd
Agonum viridicupreum (Goeze, 1777)	Susceptible	4c/Su3	19	53	0,4064	MG(E)	Zeldzaam
Amara aenea (De Geer, 1774)	Safe/Low Risk	S/LR	179	250	0,0853	DG(E)	Momenteel niet bedreigd
Amara anthobia Villa, 1833	Susceptible	4c/Su3	64	59	-0,1216	DG(S) Grassland	Zeldzaam

Species	Red List 2007	Category	<1980	>1980	Decline	Habitat	Rode Lijst 2007
Amara apricaria (PAYKULL, 1790)	Safe/Low Risk	S/LR	72	67	-0,1170	DG(E)	Momenteel niet bedreigd
Amara aulica (PANZER, 1797)	Susceptible	4c/Su3	32	61	0,2365	MG(E)	Zeldzaam
Amara bifrons (GYLLENHAL, 1810)	Susceptible	4c/Su3	65	58	-0,1376	DG(S)	Zeldzaam
Amara brunnea (GYLLENHAL, 1810)	Critically Endangered	1b	0	2	1,0000	FO(S)	Met uitsterven bedreigd
Amara communis (PANZER, 1797)	Safe/Low Risk	S/LR	84	172	0,2699	MG(E)	Momenteel niet bedreigd
Amara concinna (ZIMMERMAN, 1831)	Extinct	0	3	0	-1,0000	RB	Uitgestorven
Amara consularis (DUFTSCHMID, 1812)	Vulnerable	3b*	37	23	-0,3088	DG(S)	Kwetsbaar
Amara convexior STEPHENS, 1828	Susceptible	4b/Su2	34	30	-0,1431	DG(S) Grassland	Zeldzaam
Amara convexiuscula (MARSHAM, 1802)	Susceptible	4b/Su2	23	26	-0,0202	SM	Zeldzaam
Amara cursitans ZIMMERMAN, 1831	Susceptible	4a/Su1	2	9	0,5853	DG(S)	Zeldzaam
Amara curta DEJEAN, 1828	Susceptible	4c/Su3	40	40	-0,0814	DG(S) Grassland	Zeldzaam
Amara equestris (DUFTSCHMID, 1812)	Susceptible	4c/Su3	24	40	0,1721	DG(S) Grassland	Zeldzaam
Amara eurynota (PANZER, 1797)	Susceptible	4b/Su2	29	22	-0,2162	DG(S) Grassland	Zeldzaam
Amara famelica ZIMMERMAN, 1832	Vulnerable	3b*	33	20	-0,3203	DG(S) Heathland	Kwetsbaar
Amara familiaris (DUFTSCHMID, 1812)	Safe/Low Risk	S/LR	157	191	0,0165	DG(E)	Momenteel niet bedreigd
Amara fulva (O.F. MÜLLER, 1776)	Susceptible	4c/Su3	83	54	-0,2881	DG(S)	Zeldzaam
Amara fulvipes SERVILLE, 1821	Extinct	0	5	0	-1,0000	DG(S)	Uitgestorven
Amara infima (DUFTSCHMID, 1812)	Vulnerable	3b*	32	16	-0,4037	DG(S) Heathland	Kwetsbaar
Amara ingenua (DUFTSCHMID, 1812)	Insufficiently known	?a	1	0	-1,0000	DG(S) Grassland	Onvoldoende gekend
Amara kulti FASSATI, 1947	Vulnerable	3b	17	10	-0,3336	DG(S) Grassland	Kwetsbaar
Amara lucida (DUFTSCHMID, 1812)	Vulnerable	3b*	29	18	-0,3095	DB	Kwetsbaar
Amara lunicollis SCHIØDTE, 1837	Safe/Low Risk	S/LR	103	190	0,2209	MG(E)	Momenteel niet bedreigd
Amara majuscula (CHAUDOIR, 1850)	Susceptible	4a/Su1	1	3	0,4364	DG(S) Grassland	Zeldzaam
Amara montivaga STURM, 1825	Vulnerable	3b	19	9	-0,4261	DG(S) Grassland	Kwetsbaar
Amara municipalis (DUFTSCHMID, 1812)	Susceptible	4a/Su1	2	2	-0,0814	CG	Zeldzaam
Amara nitida STURM, 1825	Endangered	2b	11	2	-0,7324	CG	Bedreigd
Amara ovata (FABRICIUS, 1792)	Safe/Low Risk	S/LR	61	70	-0,0127	DG(S) Grassland	Momenteel niet bedreigd
Amara plebeja (GYLLENHAL, 1810)	Safe/Low Risk	S/LR	153	202	0,0573	MG(E)	Momenteel niet bedreigd
Amara praetermissa (SAHLBERG, 1827)	Endangered	2b	24	5	-0,6993	DG(S)	Bedreigd
Amara quenseli (SCHOENHER, 1806)	Endangered	2b	15	4	-0,6306	DG(S) Grassland	Bedreigd
Amara similata (GYLLENHAL, 1810)	Safe/Low Risk	S/LR	125	183	0,1086	RA(E)	Momenteel niet bedreigd
Amara spreta DEJEAN, 1831	Safe/Low Risk	S/LR	95	79	-0,1720	DG(S)	Momenteel niet bedreigd
Amara strenua ZIMMERMAN, 1831	Susceptible	4a/Su1	3	2	-0,2769	MG(E)	Zeldzaam
Amara tibialis (PAYKULL, 1798)	Susceptible	4c/Su3	29	46	0,1480	DB	Zeldzaam
Amara tricuspidata DEJEAN, 1831	Endangered	2b	35	5	-0,7836	DG(S) Grassland	Bedreigd
Anillus caecus (DUVAL, 1851)	Insufficiently known	?b	2	0	-1,0000	SYN	Onvoldoende gekend
Anisodactylus binotatus (FABRICIUS, 1787)	Safe/Low Risk	S/LR	146	233	0,1510	MG(E)	Momenteel niet bedreigd
Anisodactylus nemorivagus (DUFTSCHMID, 1812)	Critically Endangered	1a	17	2	-0,8183	DG(S) Heathland	Met uitsterven bedreigd
Anisodactylus poeciloides (STEPHENS, 1828)	Critically Endangered	1b	6	1	-0,7519	SM	Met uitsterven bedreigd
Anisodactylus signatus (PANZER, 1797)	Critically Endangered	1a	9	1	-0,8275	DG(S)	Met uitsterven bedreigd

Species	Red List 2007	Category	<1980	>1980	Decline	Habitat	Rode Lijst 2007
Asaphidion curtum (Heyden, 1870)	Safe/Low Risk	S/LR	54	114	0,2840	FO(E)	Momenteel niet bedreigd
Asaphidion flavipes (Linnaeus, 1761)	Safe/Low Risk	S/LR	100	141	0,0900	DG(E)	Momenteel niet bedreigd
Asaphidion pallipes (Duftschmid, 1812)	Endangered	2b	45	11	-0,6561	CG	Bedreigd
Asaphidion stierlini (Heyden, 1880)	Safe/Low Risk	S/LR	3	59	0,8871	DG(S)	Momenteel niet bedreigd
Badister anomalus (*collaris*) (Perris, 1806)	Susceptible	4b/Su2	13	16	0,0223	M ESW(E)	Zeldzaam
Badister bullatus (Schrank, 1798)	Safe/Low Risk	S/LR	85	154	0,2123	FO(E)	Momenteel niet bedreigd
Badister dilatatus Chaudoir, 1837	Susceptible	4c/Su3	27	41	0,1266	M ESW(E)	Zeldzaam
Badister lacertosus Sturm, 1815	Safe/Low Risk	S/LR	46	152	0,4747	DG(E)	Momenteel niet bedreigd
Badister peltatus (Panzer, 1797)	Susceptible	4a/Su1	12	10	-0,1710	M ESW(E)	Zeldzaam
Badister sodalis (Duftschmid, 1812)	Safe/Low Risk	S/LR	54	106	0,2503	MG(E)	Momenteel niet bedreigd
Badister unipustulatus Bonelli, 1813	Susceptible	4c/Su3	27	35	0,0482	M ESW(E)	Zeldzaam
Bembidion aeneum Germar, 1824	Susceptible	4a/Su1	15	12	-0,1908	SM	Zeldzaam
Bembidion argenteolum Ahrens, 1812	Endangered	2b	21	7	-0,5586	OSW	Bedreigd
Bembidion articulatum (Panzer, 1796)	Safe/Low Risk	S/LR	130	109	-0,1680	MG(E)	Momenteel niet bedreigd
Bembidion assimile Gyllenhal, 1810	Safe/Low Risk	S/LR	70	68	-0,0957	M ESW(E)	Momenteel niet bedreigd
Bembidion atrocoeruleum Stephens, 1829	Susceptible	4a/Su1	5	7	0,0865	RB	Zeldzaam
Bembidion biguttatum (Fabricius, 1779)	Safe/Low Risk	S/LR	99	128	0,0469	MG(E)	Momenteel niet bedreigd
Bembidion bipunctatum (Linnaeus, 1761)	Susceptible	4b/Su2	12	20	0,1721	M ESW(E)	Zeldzaam
Bembidion bruxellense Wesmael, 1835	Vulnerable	3a	80	48	-0,3248	OSW	Kwetsbaar
Bembidion clarki (*clarkii*) Dawson, 1849	Susceptible	4a/Su1	4	11	0,4005	FO(S)	Zeldzaam
Bembidion decorum (Zenker, 1801)	Susceptible	4a/Su1	17	13	-0,2124	RB	Zeldzaam
Bembidion deletum Serville, 1821	Susceptible	4c/Su3	39	42	-0,0445	FO(S)	Zeldzaam
Bembidion dentellum (Thunberg, 1787)	Safe/Low Risk	S/LR	83	105	0,0360	M ESW(E)	Momenteel niet bedreigd
Bembidion doris (Panzer, 1797)	Susceptible	4c/Su3	54	55	-0,0722	OSW	Zeldzaam
Bembidion elongatum Dejean, 1831	Susceptible	4a/Su1	9	8	-0,1395	RB	Zeldzaam
Bembidion ephippium (Marsham, 1802)	Critically Endangered	1a	10	1	-0,8434	SM	Met uitsterven bedreigd
Bembidion fasciolatum (Duftschmid, 1812)	Susceptible	4a/Su1	1	1	-0,0814	RB	Zeldzaam
Bembidion femoratum Sturm, 1825	Safe/Low Risk	S/LR	114	106	-0,1174	M ESW(E)	Momenteel niet bedreigd
Bembidion fluviatile Dejean, 1831	Susceptible	4a/Su1	2	4	0,2590	RB	Zeldzaam
Bembidion fumigatum (Duftschmid, 1812)	Susceptible	4b/Su2	18	16	-0,1395	SM	Zeldzaam
Bembidion genei (*tetragrammum*) (Küster, 1847)	Vulnerable	3a	84	52	-0,3107	M ESW(E)	Kwetsbaar
Bembidion gilvipes Sturm, 1825	Susceptible	4b/Su2	27	31	-0,0125	MG(E)	Zeldzaam
Bembidion guttula (Fabricius, 1792)	Safe/Low Risk	S/LR	70	87	0,0272	MG(E)	Momenteel niet bedreigd
Bembidion harpaloides Serville, 1821	Susceptible	4c/Su3	35	39	-0,0274	FO(E)	Zeldzaam
Bembidion humerale Sturm, 1825	Susceptible	4a/Su1	3	9	0,4364	HB	Zeldzaam
Bembidion inustum Duval, 1857	New	New	0	1	1,0000	M ESW(E)	Nieuw
Bembidion iricolor Bedel, 1879	Susceptible	4b/Su2	19	19	-0,0814	SM	Zeldzaam
Bembidion lampros (Herbst, 1784)	Safe/Low Risk	S/LR	207	294	0,0936	DG(E)	Momenteel niet bedreigd
Bembidion laterale Samouelle, 1819	Susceptible	4a/Su1	2	6	0,4364	SM	Zeldzaam
Bembidion litorale (Olivier, 1791)	Critically Endangered	1a	64	5	-0,8755	OSW	Met uitsterven bedreigd

Species	Red List 2007	Category	<1980	>1980	Decline	Habitat	Rode Lijst 2007
Bembidion lunatum (Duftschmid, 1812)	Susceptible	4a/Su1	7	6	-0,1573	SM	Zeldzaam
Bembidion lunulatum (Fourcroy, 1785)	Safe/Low Risk	S/LR	55	157	0,4161	MG(E)	Momenteel niet bedreigd
Bembidion mannerheimi (*mannerheimii*) Sahlberg, 1834	Susceptible	4c/Su3	34	56	0,1664	FO(S)	Zeldzaam
Bembidion maritimum Stephens, 1839	Vulnerable	3b	27	14	-0,3884	SM	Kwetsbaar
Bembidion milleri Duval, 1851	Vulnerable	3b	10	4	-0,4928	OSW	Kwetsbaar
Bembidion millerianum Duval, 1851	Insufficiently known	?a	1	0	-1,0000	RB	Onvoldoende gekend
Bembidion minimum (Fabricius, 1792)	Susceptible	4c/Su3	37	37	-0,0814	SM	Zeldzaam
Bembidion monticola Sturm, 1825	Critically Endangered	1b	6	1	-0,7519	RB	Met uitsterven bedreigd
Bembidion nigricorne Gyllenhal, 1827	Vulnerable	3b*	31	18	-0,3394	DG(S) Heathland	Kwetsbaar
Bembidion nigropiceum (Gyllenhal, 1827)	New	New	0	1	1,0000	SM	Nieuw
Bembidion normannum Dejean, 1831	Susceptible	4a/Su1	16	15	-0,1133	SM	Zeldzaam
Bembidion obliquum Sturm, 1825	Susceptible	4c/Su3	54	46	-0,1603	OSW	Zeldzaam
Bembidion obtusum Serville, 1821	Safe/Low Risk	S/LR	74	97	0,0537	RA(E)	Momenteel niet bedreigd
Bembidion octomaculatum (Goeze, 1777)	Susceptible	4b/Su2	16	20	0,0300	M ESW(E)	Zeldzaam
Bembidion pallidipenne (Illiger, 1801)	Susceptible	4a/Su1	6	5	-0,1710	SM	Zeldzaam
Bembidion prasinum (Duftschmid, 1812)	Extinct	0	1	0	-1,0000	RB	Uitgestorven
Bembidion properans (Stephens, 1829)	Safe/Low Risk	S/LR	84	205	0,3492	MG(E)	Momenteel niet bedreigd
Bembidion punctulatum Drapiez, 1821	Susceptible	4a/Su1	14	12	-0,1573	RB	Zeldzaam
Bembidion quadrimaculatum (Linnaeus, 1761)	Safe/Low Risk	S/LR	110	201	0,2164	DG(S) Grassland	Momenteel niet bedreigd
Bembidion quadripustulatum Serville, 1821	Susceptible	4b/Su2	28	31	-0,0306	M ESW(E)	Zeldzaam
Bembidion quinquestriatum Gyllenhal, 1810	Vulnerable	3b	28	13	-0,4343	FO(S)	Kwetsbaar
Bembidion saxatile (Gyllenhal, 1827)	Insufficiently known	?a	1	0	-1,0000	RB	Onvoldoende gekend
Bembidion semipunctatum (Donovan, 1806)	Endangered	2b*	64	25	-0,5017	M ESW(E)	Bedreigd
Bembidion stephensi (*stephensii*) Crotch, 1866	Vulnerable	3b	12	7	-0,3373	M ESW(E)	Kwetsbaar
Bembidion stomoides Dejean, 1831	Susceptible	4a/Su1	6	5	-0,1710	RB	Zeldzaam
Bembidion striatum (Fabricius, 1792)	New	New	0	1	1,0000	OSW	Nieuw
Bembidion tenellum Erichson, 1837	Extinct	0	5	0	-1,0000	SM	Uitgestorven
Bembidion testaceum (Duftschmid, 1812)	Vulnerable	3b	12	7	-0,3373	RB	Kwetsbaar
Bembidion tetracolum Say, 1823	Safe/Low Risk	S/LR	186	252	0,0702	DG(E)	Momenteel niet bedreigd
Bembidion tibiale (Duftschmid, 1812)	Endangered	2b	11	2	-0,7324	RB	Bedreigd
Bembidion varium (Olivier, 1795)	Susceptible	4c/Su3	66	61	-0,1204	SM	Zeldzaam
Bembidion velox (Linnaeus, 1761)	Susceptible	4a/Su1	9	6	-0,2769	OSW	Zeldzaam
Blethisa multipunctata (Linnaeus, 1758)	Critically Endangered	1a	27	1	-0,9390	HB	Met uitsterven bedreigd
Brachinus crepitans (Linnaeus, 1758)	Critically Endangered	1a	9	1	-0,8275	CG	Met uitsterven bedreigd
Brachinus explodens Duftschmid, 1812	Extinct	0	5	0	-1,0000	CG	Uitgestorven
Brachinus sclopeta (Fabricius, 1792)	Extinct	0	2	0	-1,0000	CG	Uitgestorven
Bradycellus caucasicus (Chaudoir, 1846)	Endangered	2b	26	5	-0,7191	DG(S) Heathland	Bedreigd
Bradycellus csikii Laczo, 1912	Critically Endangered	1b	7	1	-0,7836	DB	Met uitsterven bedreigd
Bradycellus distinctus (Dejean, 1829)	Susceptible	4a/Su1	8	6	-0,2216	DB	Zeldzaam
Bradycellus harpalinus (Serville, 1821)	Safe/Low Risk	S/LR	125	188	0,1219	DG(S)	Momenteel niet bedreigd

Species	Red List 2007	Category	<1980	>1980	Decline	Habitat	Rode Lijst 2007
Bradycellus ruficollis (Stephens, 1828)	Susceptible	4c/Su3	46	48	-0,0602	DG(S) Heathland	Zeldzaam
Bradycellus sharpi (*sharpii*) Joy, 1912	Susceptible	4b/Su2	24	27	-0,0227	FO(S)	Zeldzaam
Bradycellus verbasci (Duftschmid, 1812)	Safe/Low Risk	S/LR	71	89	0,0314	DG(E)	Momenteel niet bedreigd
Broscus cephalotes (Linnaeus, 1758)	Endangered	2b*	81	29	-0,5336	DG(S)	Bedreigd
Calathus ambiguus (Paykull, 1790)	Critically Endangered	1b	56	9	-0,7597	DG(S) Grassland	Met uitsterven bedreigd
Calathus cinctus Motschulsky, 1850	Susceptible	4c/Su3	53	53	-0,0814	DG(S) Grassland	Zeldzaam
Calathus erratus (Sahlberg, 1827)	Safe/Low Risk	S/LR	118	85	-0,2407	DG(S)	Momenteel niet bedreigd
Calathus fuscipes (Goeze, 1777)	Safe/Low Risk	S/LR	114	128	-0,0236	DG(E)	Momenteel niet bedreigd
Calathus melanocephalus (Linnaeus, 1758)	Safe/Low Risk	S/LR	132	169	0,0420	DG(E)	Momenteel niet bedreigd
Calathus micropterus (Duftschmid, 1812)	Susceptible	4b/Su2	18	27	0,1206	FO(S)	Zeldzaam
Calathus mollis (Marsham, 1802)	Susceptible	4b/Su2	26	25	-0,1008	DB	Zeldzaam
Calathus rotundicollis Dejean, 1828	Safe/Low Risk	S/LR	54	132	0,3499	FO(E)	Momenteel niet bedreigd
Callistus lunatus (Fabricius, 1775)	Extinct	0	25	0	-1,0000	CG	Uitgestorven
Calosoma inquisitor (Linnaeus, 1758)	Vulnerable	3b*	45	18	-0,4928	FO(S)	Kwetsbaar
Calosoma maderae (Fabricius, 1775)	Extinct	0	8	0	-1,0000	DG(S)	Uitgestorven
Calosoma reticulatum (Fabricius, 1787)	Insufficiently known	?a	1	0	-1,0000	DG(S) Heathland	Onvoldoende gekend
Calosoma sycophanta (Linnaeus, 1758)	Critically Endangered	1a	41	1	-0,9594	FO(S)	Met uitsterven bedreigd
Carabus arvensis Herbst, 1784	Endangered	2b	39	6	-0,7688	HB	Bedreigd
Carabus auratus Linnaeus, 1761	Endangered	2b*	140	21	-0,7740	DG(E)	Bedreigd
Carabus auronitens Fabricius, 1792	Susceptible	4a/Su1	19	13	-0,2648	FO(S)	Zeldzaam
Carabus cancellatus Illiger, 1798	Critically Endangered	1a	77	1	-0,9782	DG(E)	Met uitsterven bedreigd
Carabus clathratus (*clatratus*) Linnaeus, 1761	Susceptible	4b/Su2	26	20	-0,2096	HB	Zeldzaam
Carabus convexus Fabricius, 1775	Extinct	0	16	0	-1,0000	CG	Uitgestorven
Carabus coriaceus Linnaeus, 1758	Endangered	2b	72	15	-0,6993	FO(S)	Bedreigd
Carabus granulatus Linnaeus, 1758	Safe/Low Risk	S/LR	168	162	-0,0994	MG(E)	Momenteel niet bedreigd
Carabus intricatus Linnaeus, 1761	Extinct	0	13	0	-1,0000	FO(S)	Uitgestorven
Carabus monilis Fabricius, 1792	Endangered	2b*	110	25	-0,6763	MG(E)	Bedreigd
Carabus nemoralis O.F. Müller, 1764	Safe/Low Risk	S/LR	99	103	-0,0617	FO(E)	Momenteel niet bedreigd
Carabus nitens Linnaeus, 1758	Endangered	2b*	52	19	-0,5263	HB	Bedreigd
Carabus nodulosus Creutzer, 1799	Insufficiently known	?a	1	0	-1,0000	FO(S)	Onvoldoende gekend
Carabus problematicus Herbst, 1786	Safe/Low Risk	S/LR	64	104	0,1598	FO(E)	Momenteel niet bedreigd
Carabus violaceus purpurascens Linnaeus, 1758	Safe/Low Risk	S/LR	70	80	-0,0148	FO(E)	Momenteel niet bedreigd
Chlaenius nigricornis (Fabricius, 1787)	Susceptible	4c/Su3	62	51	-0,1773	M ESW(E)	Zeldzaam
Chlaenius nitidulus (Schrank, 1781)	Endangered	2b	57	13	-0,6754	M ESW(E)	Bedreigd
Chlaenius sulcicollis (Paykull, 1798)	Extinct	0	1	0	-1,0000	RB	Uitgestorven
Chlaenius tristis (Schaller, 1783)	Extinct	0	9	0	-1,0000	M ESW(E)	Uitgestorven
Chlaenius velutinus (Duftschmid, 1812)	Insufficiently known	?a	2	0	-1,0000	RB	Onvoldoende gekend
Chlaenius vestitus (Paykull, 1790)	Susceptible	4c/Su3	28	36	0,0441	M ESW(E)	Zeldzaam
Cicindela campestris Linnaeus, 1758	Near-Threatened	5a/NT1	143	88	-0,3134	DG(E)	Achteruitgaand
Cicindela germanica Linnaeus, 1758	Critically Endangered	1a	16	2	-0,8080	RA(E)	Met uitsterven bedreigd

Species	Red List 2007	Category	<1980	>1980	Decline	Habitat	Rode Lijst 2007
Cicindela hybrida LINNAEUS, 1758	Near-Threatened	5a/NT1	140	87	-0,3090	DG(S)	Achteruitgaand
Cicindela maritima LATREILLE & DEJEAN, 1822	Endangered	2b	25	8	-0,5725	DB	Bedreigd
Cicindela sylvatica LINNAEUS, 1758	Critically Endangered	1a	50	4	-0,8727	DG(S) Heathland	Met uitsterven bedreigd
Clivina collaris (HERBST, 1784)	Safe/Low Risk	S/LR	98	106	-0,0423	MG(E)	Momenteel niet bedreigd
Clivina fossor (LINNAEUS, 1758)	Safe/Low Risk	S/LR	116	200	0,1885	DG(E)	Momenteel niet bedreigd
Cychrus attenuatus FABRICIUS, 1792	Susceptible	4a/Su1	6	8	0,0622	FO(S)	Zeldzaam
Cychrus caraboides (LINNAEUS, 1758)	Safe/Low Risk	S/LR	26	74	0,4148	FO(S)	Momenteel niet bedreigd
Cymindis axillaris (FABRICIUS, 1794)	Extinct	0	3	0	-1,0000	DG(S) Heathland	Uitgestorven
Cymindis humeralis (FOURCROY, 1785)	Susceptible	4a/Su1	14	13	-0,1180	DG(S) Heathland	Zeldzaam
Cymindis macularis FISCHER VON WALDHEIM, 1824	Susceptible	4a/Su1	14	10	-0,2447	DG(S) Heathland	Zeldzaam
Cymindis vaporariorum (LINNAEUS, 1758)	Endangered	2b	11	4	-0,5280	DG(S) Heathland	Bedreigd
Demetrias atricapillus (LINNAEUS, 1758)	Safe/Low Risk	S/LR	116	94	-0,1846	MG(E)	Momenteel niet bedreigd
Demetrias imperialis (GERMAR, 1824)	Susceptible	4c/Su3	40	48	0,0096	M ESW(E)	Zeldzaam
Demetrias monostigma SAMOUELLE, 1819	Susceptible	4a/Su1	13	15	-0,0100	DB	Zeldzaam
Diachromus germanus (LINNAEUS, 1758)	Susceptible	4b/Su2	30	22	-0,2323	FO(S)	Zeldzaam
Dicheirotrichus gustavii CROTCH, 1871	Susceptible	4a/Su1	21	15	-0,2447	SM	Zeldzaam
Dicheirotrichus obsoletus (DEJEAN, 1829)	Susceptible	4a/Su1	10	13	0,0496	SM	Zeldzaam
Dromius (*Calodromius*) *bifasciatus* (DEJEAN, 1825)	Endangered	2c	0	4	1,0000	FO(S)	Bedreigd
Dromius (*Calodromius*) *spilotus* (ILLIGER, 1798)	Susceptible	4c/Su3	65	44	-0,2698	FO(S)	Zeldzaam
Dromius (*Paradromius*) *linearis* (OLIVIER, 1795)	Safe/Low Risk	S/LR	87	118	0,0707	DG(E)	Momenteel niet bedreigd
Dromius (*Paradromius*) *longiceps* (DEJEAN, 1826)	Endangered	2c	1	3	0,4364	DB	Bedreigd
Dromius (*Philorhizus*) *melanocephalus* (DEJEAN, 1825)	Susceptible	4c/Su3	78	60	-0,2096	DG(E)	Zeldzaam
Dromius (*Philorhizus*) *notatus* (STEPHENS, 1827)	Vulnerable	3b	15	8	-0,3764	DB	Kwetsbaar
Dromius (*Philorhizus*) *sigma* (ROSSI, 1790)	Susceptible	4a/Su1	9	7	-0,2043	M ESW(E)	Zeldzaam
Dromius agilis (FABRICIUS, 1787)	Vulnerable	3b*	49	24	-0,4123	FO(S)	Kwetsbaar
Dromius angustus BRULLÉ, 1834	Susceptible	4a/Su1	13	14	-0,0445	FO(S)	Zeldzaam
Dromius fenestratus (FABRICIUS, 1794)	Extinct	0	9	0	-1,0000	FO(S)	Uitgestorven
Dromius meridionalis DEJEAN, 1825	Vulnerable	3b	7	4	-0,3464	FO(S)	Kwetsbaar
Dromius quadrimaculatus (LINNAEUS, 1758)	Susceptible	4c/Su3	62	58	-0,1144	FO(E)	Zeldzaam
Drypta dentata (ROSSI, 1790)	Insufficiently known	?a	1	0	-1,0000	CG	Onvoldoende gekend
Dyschirius aeneus (DEJEAN, 1825)	Safe/Low Risk	S/LR	71	95	0,0640	RB	Momenteel niet bedreigd
Dyschirius angustatus (AHRENS, 1830)	Susceptible	4a/Su1	7	13	0,2241	DB	Zeldzaam
Dyschirius chalceus ERICHSON, 1837	Extinct	0	7	0	-1,0000	SM	Uitgestorven
Dyschirius extensus (PUTZEYS, 1846)	Extinct	0	1	0	-1,0000	SM	Uitgestorven
Dyschirius globosus (HERBST, 1784)	Safe/Low Risk	S/LR	125	193	0,1348	MG(E)	Momenteel niet bedreigd
Dyschirius impunctipennis DAWSON, 1854	Extinct	0	2	0	-1,0000	DB	Uitgestorven
Dyschirius intermedius PUTZEYS, 1846	Vulnerable	3b	25	10	-0,4928	M ESW(E)	Kwetsbaar
Dyschirius laeviusculus PUTZEYS, 1846	Extinct	0	1	0	-1,0000	OSW	Uitgestorven
Dyschirius luedersi WAGNER, 1915	Safe/Low Risk	S/LR	33	77	0,3294	M ESW(E)	Momenteel niet bedreigd
Dyschirius nitidus (DEJEAN, 1825)	Extinct	0	14	0	-1,0000	RB	Uitgestorven

Species	Red List 2007	Category	<1980	>1980	Decline	Habitat	Rode Lijst 2007
Dyschirius obscurus (Gyllenhal, 1827)	Susceptible	4a/Su1	5	6	0,0096	DB	Zeldzaam
Dyschirius politus (Dejean, 1825)	Susceptible	4c/Su3	36	35	-0,0953	DG(S)	Zeldzaam
Dyschirius salinus Schaum, 1843	Susceptible	4b/Su2	11	17	0,1353	SM	Zeldzaam
Dyschirius semistriatus (Dejean, 1825)	Susceptible	4a/Su1	3	2	-0,2769	OSW	Zeldzaam
Dyschirius thoracicus (Rossi, 1790)	Susceptible	4c/Su3	51	53	-0,0622	M ESW(E)	Zeldzaam
Elaphrus aureus P.H. Müller, 1821	Susceptible	4a/Su1	7	7	-0,0814	RB	Zeldzaam
Elaphrus cupreus Duftschmid, 1812	Safe/Low Risk	S/LR	109	150	0,0779	MG(E)	Momenteel niet bedreigd
Elaphrus riparius (Linnaeus, 1758)	Safe/Low Risk	S/LR	112	121	-0,0429	M ESW(E)	Momenteel niet bedreigd
Elaphrus uliginosus Fabricius, 1775	Endangered	2b	39	15	-0,5075	MG(E)	Bedreigd
Harpalus (*Ophonus*) *ardosiacus* (Lutshnik, 1922)	Susceptible	4a/Su1	6	4	-0,2769	CG	Zeldzaam
Harpalus (*Ophonus*) *azureus* (Fabricius, 1775)	Endangered	2b	9	2	-0,6824	CG	Bedreigd
Harpalus (*Ophonus*) *cordatus* (Duftschmid, 1812)	Extinct	0	7	0	-1,0000	CG	Uitgestorven
Harpalus (*Ophonus*) *melleti* (Heer, 1837)	Susceptible	4a/Su1	1	3	0,4364	CG	Zeldzaam
Harpalus (*Ophonus*) *nitidulus* (Stephens, 1828)	Vulnerable	3b	10	4	-0,4928	CG	Kwetsbaar
Harpalus (*Ophonus*) *puncticeps* (Stephens, 1828)	Susceptible	4c/Su3	35	33	-0,1105	CG	Zeldzaam
Harpalus (*Ophonus*) *puncticollis* (Paykull, 1798)	Endangered	2b	15	4	-0,6306	CG	Bedreigd
Harpalus (*Ophonus*) *rufibarbis* (Fabricius, 1792)	Susceptible	4c/Su3	35	56	0,1523	DG(E)	Zeldzaam
Harpalus (*Ophonus*) *rupicola* (Sturm, 1818)	Critically Endangered	1b	7	1	-0,7836	CG	Met uitsterven bedreigd
Harpalus (*Ophonus*) *sabulicola* (Panzer, 1796)	Extinct	0	2	0	-1,0000	CG	Uitgestorven
Harpalus (*Ophonus*) *signaticornis* (Duftschmid, 1812)	Endangered	2b	7	2	-0,6094	DG(S)	Bedreigd
Harpalus (*Ophonus*) *stictus* Stephens, 1828	Extinct	0	1	0	-1,0000	CG	Uitgestorven
Harpalus (*Pseudoophonus*) *calceatus* (Duftschmid, 1812)	Vulnerable	3b	2	1	-0,4037	CG	Kwetsbaar
Harpalus (*Pseudoophonus*) *griseus* (Panzer, 1797)	Susceptible	4c/Su3	40	32	-0,1908	DG(S) Grassland	Zeldzaam
Harpalus (*Pseudoophonus*) *rufipes* (De Geer, 1774)	Safe/Low Risk	S/LR	142	216	0,1275	RA(E)	Momenteel niet bedreigd
Harpalus affinis (Schrank, 1781)	Safe/Low Risk	S/LR	177	165	-0,1161	DG(E)	Momenteel niet bedreigd
Harpalus anxius (Duftschmid, 1812)	Susceptible	4c/Su3	70	63	-0,1334	DG(S)	Zeldzaam
Harpalus atratus Latreille, 1804	Extinct	0	9	0	-1,0000	CG	Uitgestorven
Harpalus attenuatus Stephens, 1828	Susceptible	4c/Su3	15	54	0,5072	DG(S)	Zeldzaam
Harpalus autumnalis (Duftschmid, 1812)	Vulnerable	3b	19	10	-0,3821	DG(S) Grassland	Kwetsbaar
Harpalus dimidiatus (Rossi, 1790)	Extinct	0	12	0	-1,0000	CG	Uitgestorven
Harpalus distinguendus (Duftschmid, 1812)	Susceptible	4c/Su3	74	57	-0,2089	M ESW(E)	Zeldzaam
Harpalus flavescens (Piller & Mitterpacher, 1783)	Critically Endangered	1a	16	2	-0,8080	DB	Met uitsterven bedreigd
Harpalus froelichi (*froelichii*) Sturm, 1818	Endangered	2b	32	7	-0,6866	DG(S) Grassland	Bedreigd
Harpalus honestus (Duftschmid, 1812)	Critically Endangered	1b	7	1	-0,7836	CG	Met uitsterven bedreigd
Harpalus latus (Linnaeus, 1758)	Safe/Low Risk	S/LR	57	114	0,2590	DG(E)	Momenteel niet bedreigd
Harpalus luteicornis (Duftschmid, 1812)	Susceptible	4a/Su1	4	13	0,4682	DG(E)	Zeldzaam
Harpalus melancholicus Dejean, 1829	Extinct	0	5	0	-1,0000	DB	Uitgestorven
Harpalus modestus Dejean, 1829	Vulnerable	3b	14	6	-0,4662	CG	Kwetsbaar
Harpalus neglectus Serville, 1821	Critically Endangered	1b	29	4	-0,7902	DG(S) Grassland	Met uitsterven bedreigd
Harpalus parallelus (Dejean, 1829)	Extinct	0	1	0	-1,0000	CG	Uitgestorven

Species	Red List 2007	Category	<1980	>1980	Decline	Habitat	Rode Lijst 2007
Harpalus quadripunctatus (*laevipes*) DEJEAN, 1828	Critically Endangered	1b	6	1	-0,7519	FO(S)	Met uitsterven bedreigd
Harpalus rubripes (DUFTSCHMID, 1812)	Safe/Low Risk	S/LR	78	77	-0,0878	DG(E)	Momenteel niet bedreigd
Harpalus rufipalpis STURM, 1818	Susceptible	4c/Su3	35	38	-0,0404	DG(S)	Zeldzaam
Harpalus serripes (QUENSEL, 1806)	Endangered	2b	17	4	-0,6668	DG(S) Grassland	Bedreigd
Harpalus servus (DUFTSCHMID, 1812)	Susceptible	4b/Su2	24	21	-0,1472	DB	Zeldzaam
Harpalus smaragdinus (DUFTSCHMID, 1812)	Vulnerable	3b*	53	28	-0,3805	DG(S) Grassland	Kwetsbaar
Harpalus solitaris DEJEAN, 1829	Vulnerable	3b	8	4	-0,4037	DG(S)	Kwetsbaar
Harpalus tardus (PANZER, 1797)	Safe/Low Risk	S/LR	111	116	-0,0594	DG(E)	Momenteel niet bedreigd
Harpalus vernalis (*pumilus*) (DUFTSCHMID, 1801)	Endangered	2b	20	7	-0,5416	DG(S) Grassland	Bedreigd
Lebia chlorocephala (HOFFMANN, 1803)	Susceptible	4c/Su3	56	40	-0,2447	MG(E)	Zeldzaam
Lebia cruxminor (LINNAEUS, 1758)	Critically Endangered	1a	16	1	-0,8992	CG	Met uitsterven bedreigd
Lebia cyanocephala (LINNAEUS, 1758)	Extinct	0	6	0	-1,0000	DG(S) Grassland	Uitgestorven
Lebia marginata (FOURCROY, 1785)	Extinct	0	8	0	-1,0000	DG(S)	Uitgestorven
Leistus ferrugineus (LINNAEUS, 1758)	Safe/Low Risk	S/LR	115	185	0,1549	DG(E)	Momenteel niet bedreigd
Leistus fulvibarbis DEJEAN, 1826	Safe/Low Risk	S/LR	62	132	0,2879	FO(E)	Momenteel niet bedreigd
Leistus piceus FRÖHLICH, 1799	Critically Endangered	1b	0	1	1,0000	FO(S)	Met uitsterven bedreigd
Leistus rufomarginatus (DUFTSCHMID, 1812)	Safe/Low Risk	S/LR	62	157	0,3653	FO(E)	Momenteel niet bedreigd
Leistus spinibarbis (FABRICIUS, 1775)	Vulnerable	3b*	64	27	-0,4723	FO(S)	Kwetsbaar
Leistus terminatus (HELLWIG, 1793)	Safe/Low Risk	S/LR	60	102	0,1817	MG(E)	Momenteel niet bedreigd
Licinus depressus (PAYKULL, 1790)	Susceptible	4a/Su1	7	7	-0,0814	DB	Zeldzaam
Licinus punctatulus (FABRICIUS, 1792)	Extinct	0	1	0	-1,0000	DG(S)	Uitgestorven
Lionychus quadrillum (DUFTSCHMID, 1812)	Susceptible	4a/Su1	10	10	-0,0814	DG(S)	Zeldzaam
Loricera pilicornis (FABRICIUS, 1775)	Safe/Low Risk	S/LR	123	276	0,3118	MG(E)	Momenteel niet bedreigd
Masoreus wetterhali (*wetterhallii*) (GYLLENHAL, 1813)	Susceptible	4b/Su2	23	22	-0,1034	DG(S)	Zeldzaam
Metabletus (*Syntomus*) *foveatus* (FOURCROY, 1785)	Safe/Low Risk	S/LR	109	127	-0,0051	DG(S)	Momenteel niet bedreigd
Metabletus (*Syntomus*) *truncatellus* (LINNAEUS, 1761)	Safe/Low Risk	S/LR	53	80	0,1237	DG(S) Grassland	Momenteel niet bedreigd
Microlestes maurus (STURM, 1827)	Susceptible	4a/Su1	15	12	-0,1908	CG	Zeldzaam
Microlestes minutulus (GOEZE, 1777)	Susceptible	4b/Su2	17	29	0,1834	DG(S)	Zeldzaam
Molops piceus (PANZER, 1793)	Susceptible	4a/Su1	22	15	-0,2665	FO(S)	Zeldzaam
Nebria brevicollis (FABRICIUS, 1792)	Safe/Low Risk	S/LR	156	299	0,2390	DG(E)	Momenteel niet bedreigd
Nebria livida (LINNAEUS, 1758)	Insufficiently known	?a	2	1	-0,4037	OSW	Onvoldoende gekend
Nebria salina FAIRMAIRE & LABOULBENE, 1854	Safe/Low Risk	S/LR	84	131	0,1397	DG(S) Grassland	Momenteel niet bedreigd
Notiophilus aestuans (*aesthuans*) (MOTSCHULSKY, 1864)	Endangered	2b	3	1	-0,5586	CG	Bedreigd
Notiophilus aquaticus (LINNAEUS, 1758)	Safe/Low Risk	S/LR	74	80	-0,0425	DG(S) Heathland	Momenteel niet bedreigd
Notiophilus biguttatus (FABRICIUS, 1779)	Safe/Low Risk	S/LR	164	247	0,1226	FO(E)	Momenteel niet bedreigd
Notiophilus germinyi FAUVEL, 1863	Susceptible	4b/Su2	21	31	0,1127	DG(S) Heathland	Zeldzaam
Notiophilus palustris (DUFTSCHMID, 1812)	Safe/Low Risk	S/LR	128	163	0,0393	MG(E)	Momenteel niet bedreigd
Notiophilus quadripunctatus DEJEAN, 1826	Susceptible	4b/Su2	16	29	0,2125	FO(S)	Zeldzaam
Notiophilus rufipes CURTIS, 1829	Safe/Low Risk	S/LR	74	136	0,2191	FO(E)	Momenteel niet bedreigd
Notiophilus substriatus WATERHOUSE, 1833	Safe/Low Risk	S/LR	98	143	0,1070	DG(S) Grassland	Momenteel niet bedreigd

Species	Red List 2007	Category	<1980	>1980	Decline	Habitat	Rode Lijst 2007
Odacantha melanura (Linnaeus, 1766)	Susceptible	4c/Su3	44	33	-0,2216	M ESW(E)	Zeldzaam
Olisthopus rotundatus (Paykull, 1798)	Susceptible	4c/Su3	39	43	-0,0327	DG(S) Heathland	Zeldzaam
Omophron limbatum (Fabricius, 1776)	Susceptible	4c/Su3	39	45	-0,0100	M ESW(E)	Zeldzaam
Oodes helopioides (Fabricius, 1792)	Safe/Low Risk	S/LR	62	71	-0,0138	MG(E)	Momenteel niet bedreigd
Panagaeus bipustulatus (Fabricius, 1775)	Susceptible	4c/Su3	37	49	0,0588	DG(S)	Zeldzaam
Panagaeus cruxmajor (Linnaeus, 1758)	Safe/Low Risk	S/LR	67	65	-0,0964	MG(E)	Momenteel niet bedreigd
Parophonus maculicornis (Duftschmid, 1812)	Susceptible	4b/Su2	22	29	0,0565	MG(E)	Zeldzaam
Patrobus atrorufus (Stroem, 1768)	Susceptible	4c/Su3	32	64	0,2590	FO(S)	Zeldzaam
Perigona nigriceps (Dejean, 1831)	Susceptible	4a/Su1	1	3	0,4364	RA(E)	Zeldzaam
Perileptus areolatus (Creutzer, 1799)	Critically Endangered	1b	2	1	-0,4037	RB	Met uitsterven bedreigd
Pogonus chalceus (Marsham, 1802)	Susceptible	4b/Su2	21	20	-0,1055	SM	Zeldzaam
Pogonus littoralis Duftschmid, 1812	Critically Endangered	1b	5	1	-0,7095	SM	Met uitsterven bedreigd
Pogonus luridipennis (Germar, 1822)	Critically Endangered	1b	6	1	-0,7519	SM	Met uitsterven bedreigd
Polystichus connexus (Fourcroy, 1785)	New	New	0	1	1,0000	DG(S)	Nieuw
Pristonychus (*Laemostenus*) *terricola* (Herbst, 1783)	Vulnerable	3b*	32	19	-0,3294	SYN	Kwetsbaar
Pterostichus (*Poecilus*) *cupreus* (Linnaeus, 1758)	Safe/Low Risk	S/LR	125	191	0,1297	MG(E)	Momenteel niet bedreigd
Pterostichus (*Poecilus*) *kugelanni* (Panzer, 1797)	Critically Endangered	1a	24	2	-0,8678	DG(S)	Met uitsterven bedreigd
Pterostichus (*Poecilus*) *lepidus* (Leske, 1785)	Vulnerable	3a	88	44	-0,4037	DG(S) Heathland	Kwetsbaar
Pterostichus (*Poecilus*) *punctulatus* (Schaller, 1783)	Extinct	0	14	0	-1,0000	DG(S)	Uitgestorven
Pterostichus (*Poecilus*) *versicolor* (Sturm, 1824)	Safe/Low Risk	S/LR	129	187	0,1037	DG(E)	Momenteel niet bedreigd
Pterostichus anthracinus (Illiger, 1798)	Safe/Low Risk	S/LR	61	91	0,1179	M ESW(E)	Momenteel niet bedreigd
Pterostichus aterrimus (Herbst, 1784)	Endangered	2b	13	5	-0,5075	OSW	Bedreigd
Pterostichus cristatus (Dufour, 1820)	Susceptible	4b/Su2	12	18	0,1206	FO(S)	Zeldzaam
Pterostichus diligens (Sturm, 1824)	Safe/Low Risk	S/LR	100	160	0,1523	MG(E)	Momenteel niet bedreigd
Pterostichus gracilis (Dejean, 1828)	Susceptible	4b/Su2	26	25	-0,1008	M ESW(E)	Zeldzaam
Pterostichus interstinctus (*ovoideus*) (Sturm, 1824)	Extinct	0	7	0	-1,0000	CG	Uitgestorven
Pterostichus longicollis (Duftschmid, 1812)	Critically Endangered	1b	7	1	-0,7836	SM	Met uitsterven bedreigd
Pterostichus macer (Marsham, 1802)	Vulnerable	3b	8	4	-0,4037	SM	Kwetsbaar
Pterostichus madidus (Fabricius, 1775)	Safe/Low Risk	S/LR	52	94	0,2113	FO(E)	Momenteel niet bedreigd
Pterostichus melanarius (Illiger, 1798)	Safe/Low Risk	S/LR	132	199	0,1231	DG(E)	Momenteel niet bedreigd
Pterostichus minor (Gyllenhal, 1827)	Safe/Low Risk	S/LR	111	181	0,1615	MG(E)	Momenteel niet bedreigd
Pterostichus niger (Schaller, 1783)	Safe/Low Risk	S/LR	102	182	0,2050	FO(E)	Momenteel niet bedreigd
Pterostichus nigrita (Paykull, 1790)	Safe/Low Risk	S/LR	132	217	0,1655	MG(E)	Momenteel niet bedreigd
Pterostichus oblongopunctatus (Fabricius, 1787)	Safe/Low Risk	S/LR	76	156	0,2711	FO(E)	Momenteel niet bedreigd
Pterostichus quadrifoveolatus Letzner, 1852	Susceptible	4c/Su3	36	32	-0,1395	DG(S) Heathland	Zeldzaam
Pterostichus rhaeticus Heer, 1837	Safe/Low Risk	S/LR	18	74	0,5548	HB	Momenteel niet bedreigd
Pterostichus strenuus (Panzer, 1797)	Safe/Low Risk	S/LR	138	272	0,2522	DG(E)	Momenteel niet bedreigd
Pterostichus vernalis (Panzer, 1796)	Safe/Low Risk	S/LR	145	252	0,1924	MG(E)	Momenteel niet bedreigd
Somotrichus elevatus (Fabricius, 1787)	Insufficiently known	?b	1	0	-1,0000	SYN	Onvoldoende gekend
Sphodrus leucophthalmus (Linnaeus, 1758)	Extinct	0	13	0	-1,0000	RA(E)	Uitgestorven

Species	Red List 2007	Category	<1980	>1980	Decline	Habitat	Rode Lijst 2007
Stenolophus mixtus (Herbst, 1784)	Safe/Low Risk	S/LR	76	137	0,2099	M ESW(E)	Momenteel niet bedreigd
Stenolophus skrimshiranus Stephens, 1828	Vulnerable	3b	34	15	-0,4548	MG(E)	Kwetsbaar
Stenolophus teutonus (Schrank, 1781)	Safe/Low Risk	S/LR	113	181	0,1528	MG(E)	Momenteel niet bedreigd
Stomis pumicatus (Panzer, 1796)	Safe/Low Risk	S/LR	75	95	0,0366	FO(E)	Momenteel niet bedreigd
Synuchus nivalis (*vivalis*) (Panzer, 1797)	Safe/Low Risk	S/LR	57	91	0,1512	DG(S) Grassland	Momenteel niet bedreigd
Tachys bistriatus (Duftschmid, 1812)	Endangered	2b	34	11	-0,5688	RB	Bedreigd
Tachys bisulcatus (Nicolai, 1822)	Endangered	2b	5	1	-0,7095	RB	Bedreigd
Tachys micros (Fischer Von Waldheim, 1828)	Susceptible	4a/Su1	17	13	-0,2124	RB	Zeldzaam
Tachys parvulus (Dejean, 1831)	Susceptible	4b/Su2	13	23	0,2010	RB	Zeldzaam
Tachys quadrisignatus (Duftschmid, 1812)	Susceptible	4a/Su1	2	2	-0,0814	RB	Zeldzaam
Tachys scutellaris Stephens, 1829	Endangered	2b	5	1	-0,7095	SM	Bedreigd
Tachyta nana (Gyllenhal, 1810)	New	New	0	4	1,0000	FO(S)	Nieuw
Thalassophilus longicornis (Sturm, 1825)	Susceptible	4a/Su1	2	4	0,2590	RB	Zeldzaam
Trechus (*Blemus*) *discus* (Fabricius, 1801)	Susceptible	4b/Su2	27	29	-0,0458	M ESW(E)	Zeldzaam
Trechus (*Epaphius*) *secalis* (Paykull, 1790)	Susceptible	4a/Su1	2	12	0,6720	HB	Zeldzaam
Trechus (*Trechoblemus*) *micros* (Herbst, 1783)	Susceptible	4c/Su3	26	48	0,2213	DG(S) Grassland	Zeldzaam
Trechus obtusus Erichson, 1837	Safe/Low Risk	S/LR	79	171	0,2955	DG(E)	Momenteel niet bedreigd
Trechus quadristriatus (Schrank, 1781)	Safe/Low Risk	S/LR	137	145	-0,0531	RA(E)	Momenteel niet bedreigd
Trechus rubens (Fabricius, 1792)	Endangered	2b	28	8	-0,6094	FO(S)	Bedreigd
Trichocellus cognatus (Gyllenhal, 1827)	Susceptible	4a/Su1	9	13	0,1020	DG(S) Heathland	Zeldzaam
Trichocellus placidus (Gyllenhal, 1827)	Susceptible	4c/Su3	26	52	0,2590	MG(E)	Zeldzaam
Trichotichnus laevicollis (Duftschmid, 1812)	Susceptible	4b/Su2	21	17	-0,1850	FO(S)	Zeldzaam
Trichotichnus nitens (Heer, 1838)	Vulnerable	3b	4	2	-0,4037	FO(S)	Kwetsbaar
Zabrus tenebrioides (Goeze, 1777)	Critically Endangered	1a	66	8	-0,8133	RA(E)	Met uitsterven bedreigd

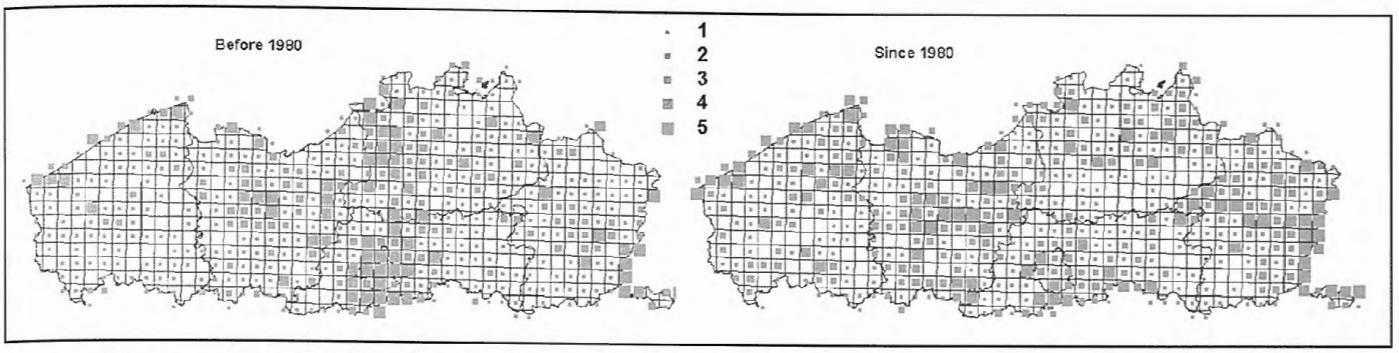

Fig. 1 - The number of carabid species per 5 km x 5 km grid cells before (left) and since 1980 (right) with 1 = 1 to 25, 2 = 26 to 50, , 3 = 51 to 75, 4 = 76 to 100 and 5 = > 100 species per grid cell.

of grid cells with records of the species before and after 1980, the decline for each species and the habitat preference are given in Table 2. A selected number of seriously threatened species are illustrated with photographs on Fig. 2 (Pictures. A-H). Table 3 gives the number and percentage of species for all Red List categories and criteria as also the numbers for each category in the previous list from DESENDER *et al.* (1995).

The numbers of species per category for both Red Lists are in the same order of magnitude for most categories, but suggest that even more species have been added to each of the 'risk'-categories (in total 98 such species in 1995; 133 species in 2007) (Table 4). 77 species from the list that were considered threatened in 1995 (pivot point 1950) are still in such categories in the new list (pivot point 1980). 101 species are now in a more severe Red List category compared to 1995, while only 43 are now classified as less threatened compared to 1995. This suggests that environmental conditions related to habitat quality and availability certainly have not improved for most of these species in recent decades.

Habitats

For all species we could add a habitat type which

Table 3 – The number of species for all Red List categories and criteria.

	n species / category	2007	2007%	1995	1995%
0: Extinct in Flanders	0: 36	36	9.42	32	8.70
1: Critically endangered	1a: 14 1b: 17	31	8.12	20	5.43
2: Endangered	2a: 0 2b and 2b*: 27 2c: 2	34	8.9	21	5.71
3: Vulnerable	3a: 3 3b: 19 3b*: 10	32	8.38	25	6.79
4: Susceptible	4a: 48 4b: 32 4c: 47	127	33.25	91	24.73
5: Near threatened	5a: 2 5b: 0 5c: 0	2	0.52	9	3.26
Safe / Low risk	104	104	27.23	135	36.68
?: Insufficiently known	?a: 9 ?b: 2	11	2.88	7	1.90
New	5	5	1.31		

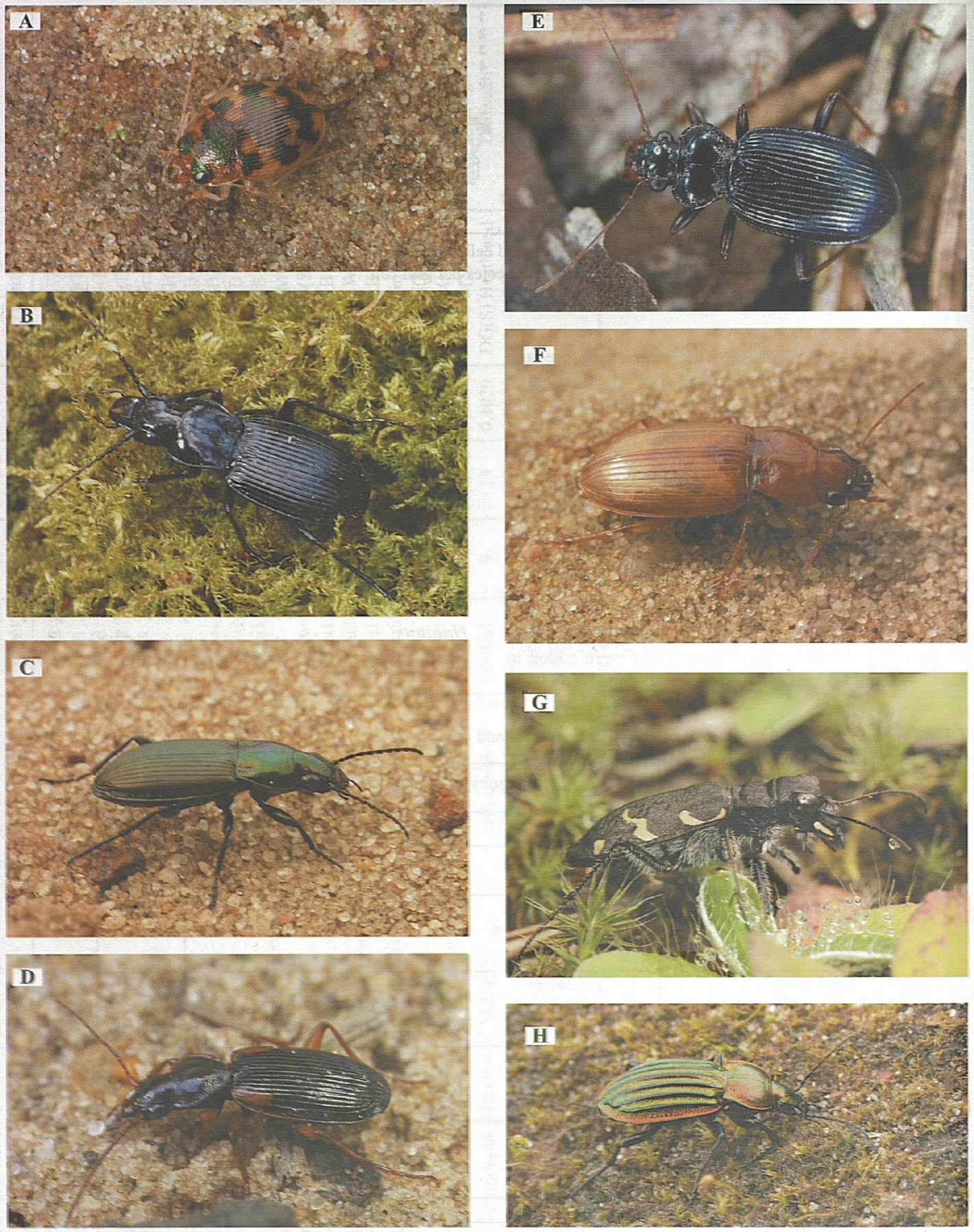

Fig. 2. – A selected number of seriously threatened species in Flanders. **A**: *Omophron limbatum*, **B**: *Pterostichus cristatus*, **C**: *Pterostichus lepidus*, **D**: *Cymindis humeralis*, **E**: *Leistus spinibarbis*, **F**: *Harpalus flavescens*, **G**: *Cicindela sylvatica*, **H**: *Carabus nitens*. (A-B: B. Van Elegem, C-H: M. Jacobs)

they prefer in Flanders and if they are stenotopic or eurytopic. Following habitat types were defined:

-Calcareous grasslands, stony slopes and other xerothermic habitats: CG (Kalkgraslanden en stenige hellingen);
-Dunes and beaches: DB (Duinen en stranden);
-Wet heathlands and peat bogs: HB (Natte heide en hoogveen);
-Salt marshes SM: (Slikken en schorren);
-Dry grasslands and other habitats on dry sandy soils, stenotopic species: DG(S) (Droge graslanden en habitatten op droge zandgrond, stenotope soorten);
-Forests, stenotopic species: FO(S) (Halfnatuurlijk bossen, stenotope soorten);
-Oligotrophic standing water: OSW (Oevers van stilstaand oligotroof water);
-River and rivulet banks: RB (Oevers van stromend water);
-Ruderal sites and arable land, eurytopic species: RA(E) (Ruigten en akkers, eurytope soorten);
-Marshes and eurytopic standing water, eurytopic species: M, ESW(E) (Moerassen en eutroof stilstaand water, eurytope soorten);
-Moist grasslands, eurytopic species: MG(E) (vochtige habitats, eurytope soorten);
-Dry grasslands and habitats, eurytopic species: DG(E) (Droge graslanden en droge habitats, eurytope soorten);
-Forests, eurytopic species: FO(E) (Halfnatuurlijk bossen, eurytope soorten);
-Synatropic habitats: SYN (antropogene habitats).

In nine of the considered habitat types more than 30% of the species are threatened (Table 4). Only in four habitats less than 30 % of the species are threatened. The latter are all habitat types with eurytopic species.

Discussion, comments and future studies

Of the 382 species ever recorded in Flanders no less than nearly 70% appear to be threatened at this moment in one way or another and are clearly linked to a number of severely threatened habitats. In the present Red List we used other and stricter definitions for the categories Critically Endangered and Endangered and less strict definitions for the categories Vulnerable, Susceptible and Near-Threatened than for the Red List of 1995. This can be an explanation for the higher amount of Red List

Table 4 – The number of species per Red List category and per habitat type.

	Calcareous grassland	Dunes and Beaches	Wet heathlands and Bogs	Salt marshes	Dry grasslands (Stenotopic species)	Forests (Stenotopic species)	Oligotrophic standing water	River and rivulet banks	Ruderal sites, arable land (Eurytopic species)	Marshes eutrophic standing water (Eurytopic species)	Moist grassland (Eurytopic species)	Dry grasslands (Eurytopic species)	Forests (Eurytopic species)	Synantropic habitats
Extinct	11	2	0	4	7	2	2	4	1	3	0	0	0	0
Critically endangered	4	2	2	5	7	5	1	2	2	0	0	1	0	0
Endangered	5	2	2	1	10	3	2	3	0	3	2	1	0	0
Vulnerable	3	2	0	2	10	6	2	1	0	4	1	0	0	1
Susceptible	5	8	4	14	27	18	6	13	1	18	8	3	2	0
Near-threatened	0	0	0	0	1	0	0	0	0	0	0	1	0	0
New	0	0	0	1	1	1	1	0	0	1	0	0	0	0
Insufficiently known	1	0	0	0	2	1	1	4	0	0	0	0	0	2
Safe / Low risk	0	0	1	0	13	1	2	1	5	12	29	24	16	0
Threatened species	23	8	4	12	34	16	7	10	3	10	3	2	0	1
Total species	**29**	**16**	**9**	**27**	**78**	**37**	**17**	**28**	**9**	**41**	**40**	**30**	**18**	**3**
% threatened	**79**	**50**	**44**	**44**	**44**	**43**	**41**	**36**	**33**	**24**	**7.5**	**7**	**0**	**33**

species in the recent list. However another possibility is that in general carabid beetles have indeed become more and more rare and threatened.
We promote the use of a standardized method (here we used IUCN categories) and well-defined quantitative criteria to make national Red Lists more objective and easier to re-evaluate in the future. Moreover this facilitates the comparison of Red Lists among countries and among different insect groups. Also the technique to correct for mapping intensity (cf. DUFRENE & DESENDER, 2007) could be useful to other insect groups when there is a large difference in map coverage between two periods.

Differences in distribution and rarity in different ecoregions

The new Red List species and their categories are restricted to Flanders. However for many species their distribution in Flanders is not uniform and therefore they can be less threatened and rare in certain or more ecoregions compared to others. This is the case for some "forest" species as *Carabus nemoralis* and *Carabus problematicus* in the Campine region, where these species are more common and can also regularly be found in heathlands and other non-forest habitats.

Differences in sampling strategy before and after 1980

Some species were also added to the Red List or put in more threatened categories (1b and 2c) although we have the impression they are more common nowadays than before. For some of these species this can be attributed to the fact that before 1980 forests and their typical forest carabid beetles were only occasionally sampled, resulting in positive trends in distribution instead of probably more correct negative trends. When such species are known as good indicators for ancient undisturbed forests their Red List category was adjusted (see categories 1b and 2c).

Less threatened because of northward range expansion?

Probably due to recent climate changes (global warming) some species might have extended their distribution area northwards during the past 10 years (and have a high positive trend). Some of them formerly appeared rare in Flanders because of a restricted geographically distribution and are still on the Red List (e.g. *Parophonus maculicornis,* some other Harpalines, ...) because where we find such species in nutrient-poor habitats such as poor grasslands they have been suggested as potential model species in order to monitor effects of nature conservation measures (DESENDER *et al.*, 2004).

Further analyses

Where there are sufficient data per decade, trend-analyses of some threatened species can be performed. For some Red List species this can be interesting to see when and in which extend their decline occurred. Other and future analyses will aim at redefining habitat preference in a more precise way for a number of ground beetles. This could yield a better insight into the environmental factors, directly responsible for the deterioration of Flemish entomofauna in general.

Acknowledgements

Many volunteers and researchers, and especially Luc Crevecoeur, Maarten Jacobs, Jorg Lambrechts, Marc Pollet, Eugène Stassen and Nobby Thys are acknowledged for their years of collecting and for passing on their records. Many thanks are due to the Dutch Carabidologist working group for passing through all records from the Dutch boarder and we thank Bernard Van Elegem and Maarten Jacobs for the use of the pictures of Fig. 2.

Realisation of this new Red List was possible by a project of the INBO conducted at the RBINS (INBO/TWOL-2006/01: Een nieuwe verspreidingsatlas en Rode Lijst van de loopkevers en zandloopkevers van Vlaanderen (Coleoptera, Carabidae)). Other financial support was obtained form the RBINS (Entomology Dept.), the Flemish Government (INBO/TWOL-, AMINAL/VLINA- en AMINAL/Bos & Groen- projects) and the Belgian Government (FWO-projects, DWTC projects MO 36/006 and BELSPO project MO 36/14). We also thank P. Grootaert for useful comments on an earlier version of this manuscript.

References

DE KNIJF, G., ANSELIN, A., GOFFART, P. & TAILLY, M., 2006. De libellen van België: verspreiding – evolutie – habitats. Libellenvereniging Gomphus en Instituut voor Natuurbehoud, 368 pp.

DEKONINCK, W., MAELFAIT, J.-P., VANKERKHOVEN, F. & GROOTAERT, P., 2005. Remarks on the distribution and use of a provisional red list of the ants of Flanders (Formicidae, Hymenoptera). *In*: PROCTER, D. & HARDING, P.T. (Editors). JNCC Report No. 367 Proceedings of *IN* Cardiff 2003, Red Lists for Invertebrates: their application at different spatial scales – practical issues, pragmatic approaches, 74-85.

DEKONINCK, W. & DESENDER, K., 2007. Een nieuwe verspreidingsatlas en rode lijst van de loopkevers van Vlaanderen (Coleoptera, Carabidae). Eindverslag INBO/TWOL-2006-01, 33 pp.

DESENDER, K., 1985. Naamlijst van de loopkevers en zandloopkevers van België (Coleoptera, Carabidae). Studiedocumenten Nr 19, Koninklijk Belgische Instituut voor Natuurwetenschappen, Brussel, 36 pp.

DESENDER, K. (1986a-d). Distribution and ecology of Carabid

beetles in Belgium (Coleoptera, Carabidae). Part 1-4. Brussels, Koninklijk Belgisch Instituut voor Natuurwetenschappen.

DESENDER, K., GROOTAERT, P., DEKONINCK, W., BAERT, L., DE BAKKER, D. & MAELFAIT, J.-P., 2004. Evaluatie van de natuurwaarde en het graslandbeheer van de bermen langs de noordelijke ring rond Brussel. *Bulletin de la Société royale belge d'Entomologie*, 140 : 126-139.

DESENDER, K., MAES, D., MAELFAIT, J.-P. & VAN KERCKVOORDE, M., 1995. *Een gedocumenteerde Rode Lijst van de zandloopkevers en loopkevers van Vlaanderen*. Brussel: Instituut voor Natuurbehoud, 208 pp.

DESENDER, K., 2005. A wingless intertidal ground beetle, new to the Belgian fauna, in the river Ijzer estuary nature restoration site: *Bembidion nigropiceum* MARSHAM, 1802. *Belgian Journal of Zoology*, 135(1) : 95-96.

DESENDER, K., & MAES, D., 1995. Carabid beetles new to or confirmed for the Belgian fauna (Col., Carabidae). *Bulletin et annales de la société royale belge d'Entomologie,* 131: 213-223.

DUELLI, P., 1994. Rote Listen der gefährdeten Tierarten der Schweiz., Bern, 95 pp.

DUFRÊNE, M. & DESENDER, K., 2007. Rapport analytique sur l'état de l'environnement Wallon 2006-2007. L'érosion de la biodiversité: les carabides: 596-597.

GRUTTKE, H. & HAUPT, H., 2005. German Red Lists for invertebrate taxa at a national level. In PROCTER, D. & HARDING, P.T. (Eds.). JNCC Report No. 367 Proceedings of *IN* Cardiff 2003, Red Lists for Invertebrates: their application at different spatial scales – practical issues, pragmatic approaches, 38-44.

HOOGEVEEN, Y., 1998. Red Data Lists in Dutch Nature Policy. *Entomologische Berichten Amsterdam,* 58 : 86-91.

MAES, D. & SWAAY, C.A.M., 1997. A new methodology for compiling national Red Lists applied to butterflies (Lepidoptera, Rhopalocera) in Flanders (N-Belgium) and the Netherlands. *Journal of Insect Conservation* 1 : 113-124.

STASSEN, E. 2002. *Polystichus connexus*: een nieuwe loopkever voor België. *Likona Jaarboek* 2002: 3.

Konjev DESENDER and Wouter DEKONINCK,
Entomology Department,
Royal Belgian Institute of Natural Sciences,
Vautierstraat 29,
B-1000 Brussels, Belgium
Wouter.Dekoninck@natuurwetenschappen.be

Dirk MAES
Research Institute for Nature and Forest,
Kliniekstraat 25,
B-1070 Brussels, Belgium
Dirk.Maes@inbo.be