A standard method for site evaluation and indication of "Red Data Book"-species, using distribution data of invertebrates.
An example based on the Hoverfly fauna (Diptera, Syrphidae) of Belgium

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Summary

A standard method is presented for analysing distribution data of invertebrates. Species are divided into ten status categories according to their rarity. Interval limits of the different categories are defined on the basis of an Arcsin-scale. This method allows for a better subdivision of both the rare and the common species than methods based on a logarithmic or arithmetical scale. Sampling efforts are taken into account as well. The total number of records of a species gives the most reliable picture of its rarity.

The proposed method may be particularly useful to recognize 'Red Data Book'-species in different countries or regions on a more standardised basis. Furthermore, this method may also be used in evaluation studies of sites, habitats or traps. The method is illustrated by the example of the Hoverfly fauna of Belgium. A check list is presented of the Belgian Hoverflies with their valuation index for the different regions of the country.

Résumé

Une methode standardisée pour analyser les données de distribution d'Invertébrés est présentée. Selon leur rareté, les espèces sont divisées en dix catégories, les intervalles étant définis par l'échelle d'ARCSIN. Cette méthode, subdivisant les espèces rares ainsi que les espèces communes, permet une meilleure analyse que les méthodes utilisant des échelles logarithmiques ou arithmétiques. L'effort d'échantillonnage est également considéré. Le nombre total de captures reflète le mieux la rareté d'une espèce.

Cette nouvelle méthode peut être extrêmement utile pour reconnaître les espèces en régression (Red Data Book species) d'un certain pays ou d'une région. Aussi, elle pourrait être utile pour évaluer la valeur écologique de certains sites, habitats ou pièges. La méthode est illustrée, en utilisant les données des Syrphides belges. Ainsi, nous présentons une liste de toutes les espèces, donnant, selon la région, leur indice biotique calculé.

Introduction

The growing attention given to invertebrates in the management of nature reserves and in national and international conservation programs during the past decade is a positive development. In this the rarity of certain species and/or the degree of threat to their survival in a deteriorating environment play an important part. Mapping schemes currently performed in the different European countries, dealing with various invertebrate groups, provide a suitable basis for the singling out of threatened or rare species. However, different countries and different entomologists apply different standards to distinguish status categories within a species group. Consequently the comparison of the status of one and the same species in different countries becomes rather difficult. In other words, the nomination of "Red Data Book"-species is based on dissimilar criteria, varying greatly according to the author or the country.

To overcome this problem, this paper proposes a more standardised approach based on the analysis of distribution data. The national status categories established by this method may also be used in site or habitat evaluation studies. In this paper the Belgian Hoverfly fauna is used as an example.

Why Hoverflies were chosen as an example

Hoverflies are eminently suitable for the purpose of an ecological evaluation of sites or habitats. They are a popular and attractive group of insects. Their ecology and taxonomy is well studied and good identification keys are available (e.g. STUBBS & FALK, 1986; VAN DER GOOT, 1981; VERLINDEN, 1991). There are many species (317 have been recorded in Belgium) and a lot of them are more or less stenotopic. The habitat requirements of the early stages vary greatly from species to species (e.g. associations with sap runs, specific plant species, fungi, dung, decaying wood and other vegetable matter, different aquatic habitats, nests of bees, wasps and ants, (specific) aphid species or small caterpillars). Hoverflies can easily been sampled, using a simple insect net, malaise traps or water traps. Up-to-date distribution maps of Hoverflies in Belgium are available (VERLINDEN, 1991), based on more than 70,000 records. The analysis of these distribution maps permits us to recognize species groups of different rarit y which, in their turn, can be used in ecological evaluation studies of traps, habitats, sites or even different regions in Belgium.

The proposed arcsin-scale method

The method we propose here is based on the number of UTM-squares (10 x 10 km) where a Hoverfly species has been recorded since 1950 (maps published in VERLINDEN, 1991). The number of UTM-squares can be considered as a measure of both the distribution pattern of a species (widespread versus local species) and its frequency (very common versus very rare species). It should be noted, however, that there may be a tendency of overestimating the large or conspicuous species, compared to the more elusive ones, especially when the great majority of data were obtained by traditional means, i.e. eye-catches. Another possibility would be the use of the total number of records [1] of a species instead of the number of UTM-squares: this would certainly give a more reliable picture of the rarity of a species. However, for the Hoverfly fauna of Belgium, this information is not (yet) computerised.

Belgium is characterised by large zoogeographical differences and is de facto divided into two (politically) separate regions: Flanders and Wallonia. For our purpose, Belgium has been subdivided into 4 zones [2] (Fig. 1). This allows for site evaluation on local, regional and national scales.

For site evaluation each species must be given a set of valuation indices according to its status (based on the number of UTM-squares or records). Altogether, 10 status categories are adopted here, ranging from the very common species (category 1) to the extremely threatened species (category 10). If necessary, the species with no recent records (in our case no records after 1950) can be given an additional value 11.

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[1] One 'record' may be defined as the observation of a species in a particular site during one particular year.

[2] These zones have been adopted as they approximately coincide with distribution patterns roughly shared by a very considerable number of species. The northern lowlands have been divided into a western and an eastern section on this ground. As for the Walloon part of the country the Sambre-Meuse valley constitutes the northern limit of the area of many hoverfly species : it therefore seemed a practical solution to divide this region into two parts as well.
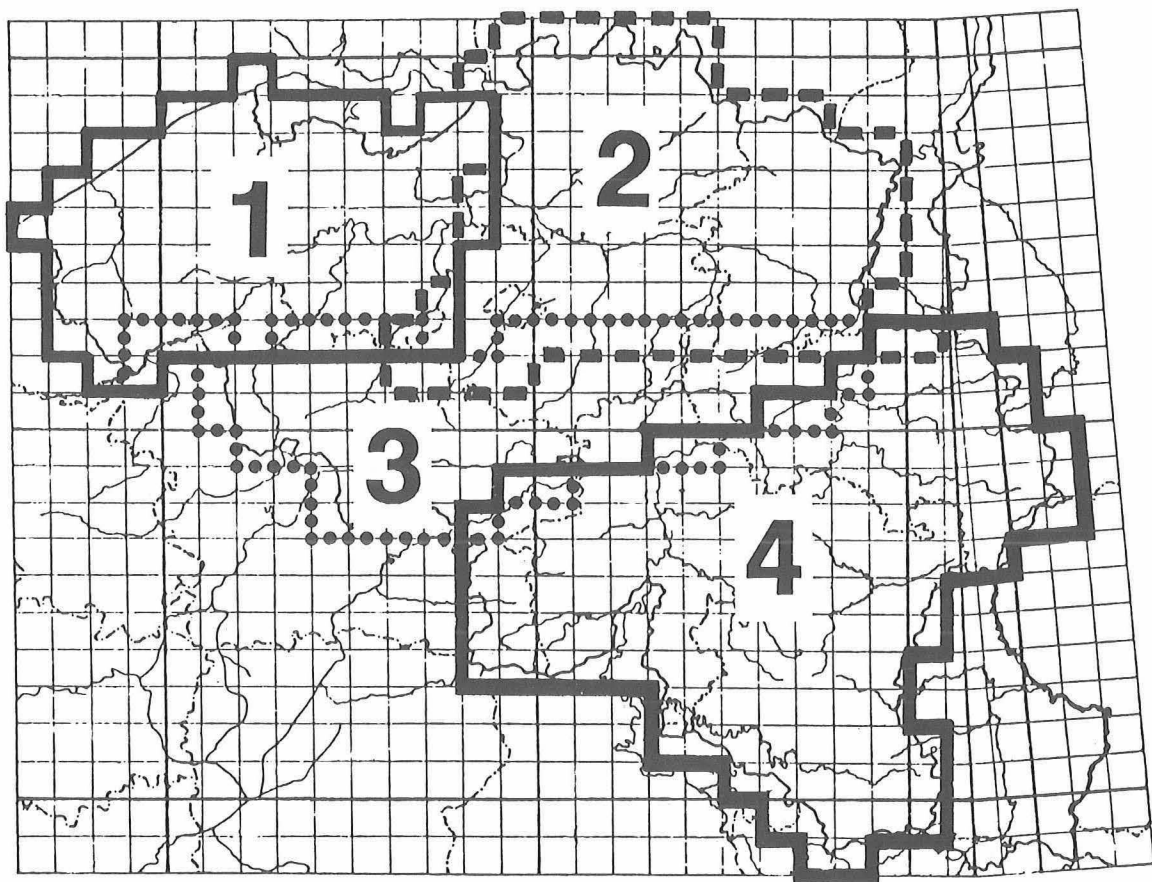
Fig. 1. For six parts of Belgium valuation categories were calculated.

1. FLANDERS: WESTERN PART
    Total of UTM-squares: 80
    Commonest hoverfly: *Episyrphus balteatus* and *Eristalis arbustorum* (59 squares)
2. FLANDERS: EASTERN PART
    Total of UTM-squares: 100
    Commonest hoverfly: *Helophilus pendulus* (74 squares)
3. WALLONIA: NORTHERN PART
    Total of UTM-squares: 78
    Commonest hoverfly: *Eristalis arbustorum* (77 squares)
4. WALLONIA: SOUTHERN PART
    Total of UTM-squares: 144
    Commonest hoverfly: *Rhingia campestris* and *Eristalis tenax* (127 squares)
1 + 2. FLANDERS
    Total of UTM-squares: 175
    Commonest hoverfly: *Helophilus pendulus* (128 squares)
3 + 4. WALLONIA
    Total of UTM-squares: 214
    Commonest hoverfly: *Rhingia campestris* and *Eristalis tenax* (193 squares)
1 + 2 + 3 + 4. BELGIUM
    Total of UTM-squares: 365
    Commonest hoverfly: *Eristalis pertinax* (297 squares).

Fig. 2.   Subdivision of 100 in 10 frequency classes on the basis of a logarithmic, arithmetical and Arcsin-scale.

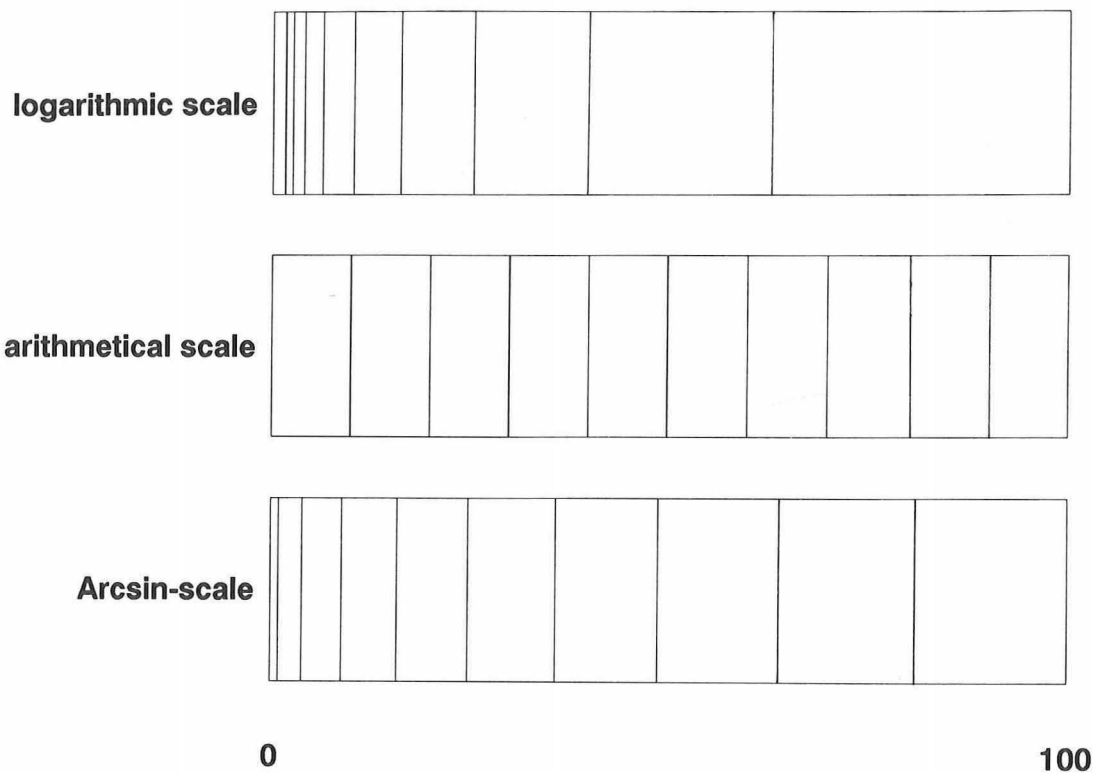The 10 categories are defined on the basis of an Arcsin-scale. Compared with a logarithmic or arithmetical scale, this method gives the most convenient subdivisions (see Fig. 2). Since an Arcsin-transformation stretches out both tails of a distribution of proportions and compresses the middle (SOKAL & ROHLF, 1981), this method allows a more precise evaluation of both 'rare' and 'common' species.

There is no evidence that sampling has been evenly spread over the territory. Therefore calculation of the interval limits of the number of UTM-squares for each category is based on the score of the most common species in each zone (e.g. cat. 1 for Flanders is defined as 105 to 128 UTM-squares, since *Helophilus pendulus* is the most common species, known from 128 UTM-squares). Intervals for the different zones and categories are shown in Table 1.

A check list of the Belgian Hoverfly species with indication of their valuation index for the different parts of Belgium is presented in Appendix 1. A frequency distribution of the number of species per category is given in Table 2. Thirteen species have not been recorded since 1950: *Chamaesyrphus lusitanicus, Chrysogaster macquarti, Eristalis cryptarum, Eumerus tarsalis, Mallota cimbiciformis, Orthonevra intermedia, Parhelophilus consimilis, Psarus abdominalis, Paragus bicolor, Paragus flammeus, Rhingia rostrata, Tropidia fasciata* and *Xylota curvipes*.

Practical use of the arcsin-scale method

Evaluation of sites (or habitats or traps) is possible by comparing:
* the number of 'rare' species (e.g. belonging to cat.7-10)
* their mean valuation index with 95%-confidence intervals
* the total sum of all valuation indices in relation to the minimal total sum which can be expected for the recorded number of species
* the number of species for each of the 10 categories in relation to habitat requirements of the immature and adult stages.

This method may also be used to compare the status of a species in different parts of a country or between countries and allows the indication of 'Red Data Book'-species on a more standardised basis (e.g. species belonging to categories 9-10). This method can be helpful when trying to find out which species are declining all over Europe. Of course the degree of threat can be subdivided into several categories, according to habitat requirements or decrease in the number of records.

A slight disadvantage of the proposed method is that the interval limits of the different valuation categories may need modification each time updated distribution data become available. With a view to the extreme population variations from year to year shown by a considerable number of species such updatings should not be undertaken at too short intervals.

Acknowledgements

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Table 1.   Interval limits of the number of UTM-squares for 10 valuation categories for different parts of Belgium. The limits are defined on the basis of an Arcsin-scale. The maximum limit of category 1 is based on the number of UTM-squares of the most abundant species in that particular part of Belgium.

Valuation Index	Flanders West	Flanders East	Flanders	Wallonia North	Wallonia South	Wallonia	Belgium
10	1	1	1	1	1	1-2	1-3
9	2	2-3	2-5	2-3	2-5	3-8	4-12
8	3-5	4-7	6-12	4-7	6-11	9-17	13-27
7	6-9	8-12	13-21	8-12	12-20	18-31	28-48
6	10-15	13-19	22-32	13-19	21-32	32-48	49-75
5	16-21	20-27	33-46	20-28	33-46	49-70	76-108
4	22-29	28-36	47-63	28-38	47-62	71-95	109-146
3	30-38	37-47	64-82	39-49	63-81	96-124	147-191
2	39-48	48-60	83-104	50-62	82-103	125-157	192-241
1	49-59	61-74	105-128	63-77	104-127	158-193	242-297

Table 2.   Frequency distribution of the number of hoverflies for the 10 valuation categories in the different parts of Belgium. Additionally listed are the total number of 1) species not (yet) recorded in this part of Belgium; 2) species only recorded before 1950; 3) species recorded since 1950; 4) species recorded before and/or after 1950.

Valuation Index	Flanders West	Flanders East	Flanders	Wallonia North	Wallonia South	Wallonia	Belgium
No records	114	54	48	82	20	12	-
only < 1950	19	24	23	23	16	17	13
10	37	33	34	31	33	48	53
9	22	24	37	38	60	60	60
8	36	43	57	49	52	56	64
7	24	46	38	20	31	34	38
6	18	25	22	22	35	30	25
5	11	21	18	12	24	18	23
4	9	14	12	11	12	8	9
3	10	10	6	9	12	11	12
2	10	12	12	13	12	17	12
1	7	11	10	7	10	6	8
only > 1950	184	239	246	212	281	288	304
< + > 1950	203	263	269	235	297	305	317

Appendix 1

Check list of the Belgian Hoverfly species with indication of their valuation index for the different regions of Belgium. The nomenclature follows VERLINDEN (1991).

1   = extremely common,
10 = extremely rare,
*   = not recorded since 1950,
-   = never recorded in this part of Belgium.

	Flanders West	Flanders East	Flanders	Wallonia North	Wallonia South	Wallonia	Belgium
Anasimyia contracta	9	8	8	*	-	*	9
A. interpuncta	6	6	6	8	9	9	7
A. lineata	5	4	4	8	8	8	6
A. lunulata	10	10	10	-	-	-	10
A. transfuga	6	7	6	8	9	9	7
Arctophila bombiformis	-	*	*	10	6	7	8
A. fulva	*	9	9	*	7	8	8
Baccha elongata	4	4	4	5	5	5	4
Blera fallax	-	*	*	*	8	9	9
Brachyopa bicolor	9	9	9	*	9	9	9
B. insensilis	-	*	*	*	10	10	10
B. panzeri	-	-	-	-	9	9	9
B. pilosa	9	7	7	9	8	9	8
B. scutellaris	7	7	7	8	9	8	8
B. testacea	-	9	9	9	8	8	9
B. vittata	-	-	-	-	9	9	10
Brachypalpus eunotus	-	-	-	-	10	10	10
B. laphriformis	10	10	9	8	8	8	9
B. meigeni	-	-	-	-	10	10	10
B. valgus	10	-	10	-	10	10	10
Caliprobola speciosa	-	8	8	7	7	7	7
Callicera aenea	-	-	-	-	10	10	10
C. bertolonii	-	-	-	10	10	10	10
C. rufa	-	-	-	-	10	10	10
Ceriana conopsoides	*	10	10	9	9	9	9
Chamaesyrphus lusitanicus	-	*	*	-	-	-	*
C. scaevoides	-	-	-	-	10	10	10
Cheilosia albipila	7	5	6	6	7	7	6
C. albitarsis	3	2	3	2	2	2	2
C. antiqua	10	8	8	8	8	8	8
C. barbata	-	10	10	9	4	6	6
C. bergenstammi	8	8	8	8	7	7	8

	Flanders West	Flanders East	Flanders	Wallonia North	Wallonia South	Wallonia	Belgium
C. caerulescens	-	10	10	9	9	9	9
C. canicularis	10	6	7	6	6	6	6
C. carbonaria	9	7	7	8	7	7	7
C. chlorus	9	6	7	6	7	6	7
C. chrysocoma	*	7	8	8	7	6	7
C. cynocephala	9	7	8	8	9	8	8
C. fasciata	-	10	10	-	10	10	10
C. flavipes	-	10	10	-	7	8	8
C. fraterna	8	6	7	7	6	7	7
C. frontalis	-	-	-	-	9	10	10
C. grossa	7	7	7	7	8	8	8
C. honesta	-	10	10	-	8	8	9
C. illustrata	9	5	6	5	2	3	4
C. impressa	7	5	6	7	6	7	6
C. intonsa	8	7	8	9	7	8	8
C. lenis	-	8	9	6	6	6	7
C. longula	10	7	8	-	9	9	8
C. maculata	10	8	8	9	8	8	8
C. mutabilis	8	7	7	*	7	8	7
C. nasutula	-	9	9	9	7	8	8
C. nebulosa	-	-	-	-	10	10	10
C. nigripes	10	9	9	8	8	8	9
C. pagana	4	3	3	4	3	3	3
C. praecox	8	8	8	8	8	8	8
C. proxima	10	7	8	8	7	6	7
C. pubera	-	10	10	-	9	9	9
C. rotundiventris	10	8	8	9	9	9	8
C. ruficollis	-	10	10	-	9	10	10
C. rufimana	10	8	8	8	8	8	8
C. scutellata	9	6	7	7	6	6	6
C. semifasciata	*	9	9	-	9	9	9
C. soror	-	-	-	10	9	9	9

	Flanders West	Flanders East	Flanders	Wallonia North	Wallonia South	Wallonia	Belgium
C. uviformis	*	10	10	-	9	9	9
C. variabilis	7	5	6	4	3	3	4
C. velutina	10	7	8	7	8	8	8
C. vernalis	6	5	5	7	5	6	5
C. vulpina	-	10	10	9	9	9	9
Chrysogaster chalybeata	9	7	8	8	8	8	8
C. hirtella	4	4	4	6	6	6	5
C. macquarti	-	*	*	-	-	-	*
C. solstitialis	6	5	5	6	4	5	5
C. viduata	7	5	6	6	5	5	5
C. virescens	10	10	9	-	8	8	8
Chrysotoxum arcuatum	-	9	9	9	5	6	7
C. bicinctum	7	4	5	5	4	5	5
C. cautum	8	3	5	2	3	3	3
C. elegans	-	10	10	*	*	*	10
C. festivum	*	6	7	8	7	7	7
C. intermedium	-	*	*	10	*	10	10
C. latilimbatum	-	-	-	-	10	10	10
C. octomaculatum	-	9	9	*	9	10	9
C. vernale	-	7	8	-	8	8	8
C. verralli	-	-	-	*	9	9	9
Criorhina asilica	8	8	8	8	7	7	8
C. berberina	6	5	5	5	5	5	5
C. floccosa	8	7	8	8	9	8	8
C. pachymera	-	8	9	9	-	9	9
C. ranunculi	10	9	9	9	8	8	8
Dasysyrphus albostriatus	5	4	5	5	5	5	5
D. friuliensis	-	-	-	9	7	8	8
D. hilaris	8	6	6	7	6	6	6
D. lunulatus	9	7	7	8	6	7	7
D. nigricornis	-	-	-	-	10	10	10
D. tricinctus	8	4	6	6	5	5	5

	Flanders West	Flanders East	Flanders	Wallonia North	Wallonia South	Wallonia	Belgium
D. venustus	6	3	4	5	3	4	4
Didea alneti	-	9	9	10	8	9	9
D. fasciata	7	7	7	8	6	7	7
D. intermedia	8	8	8	9	8	8	8
Doros conopseus	-	9	9	*	9	9	9
Epistrophe diaphana	-	-	-	-	8	8	9
E. eligans	5	4	4	4	4	4	4
E. euchroma	-	8	8	8	8	8	8
E. grossulariae	8	7	7	7	5	6	6
E. melanostoma	-	8	9	8	8	8	8
E. melanostomoides	*	-	*	8	7	8	8
E. nitidicollis	7	6	6	5	6	6	6
E. ochrostoma	-	9	9	8	8	8	9
Episyrphus auricollis	5	7	6	7	6	6	6
E. balteatus	1	1	1	1	1	1	1
E. cinctellus	7	5	6	6	3	4	5
Eriozona syrphoides	*	-	*	9	7	8	9
Eristalis abusivus	3	5	4	6	5	5	5
E. aeneus	6	7	7	6	9	7	7
E. alpinus	-	*	*	-	10	10	10
E. arbustorum	1	1	1	1	1	1	1
E. cryptarum	-	*	*	-	*	*	*
E. horticola	6	3	5	5	1	2	3
E. intricarius	2	2	2	4	4	2	3
E. jugorum	-	-	-	-	6	7	7
E. nemorum	5	2	4	3	1	2	2
E. pertinax	1	1	1	1	1	1	1
E. piceus	-	7	8	8	7	7	7
E. pratorum	6	6	6	5	6	5	5
E. rupium	-	10	10	8	5	6	6
E. sepulchralis	2	2	2	3	5	4	3
E. tenax	1	1	1	1	1	1	1

	Flanders West	Flanders East	Flanders	Wallonia North	Wallonia South	Wallonia	Belgium
Eumerus flavitarsis	-	-	-	-	9	9	9
E. ornatus	-	*	*	*	8	9	9
E. sabulonum	10	10	9	*	*	*	10
E. sogdianus	8	10	9	10	*	10	9
E. strigatus	5	7	6	7	8	7	7
E. tarsalis	-	-	-	*	*	*	*
E. tricolor	-	10	10	10	9	9	9
E. tuberculatus	8	7	7	9	8	9	8
Ferdinandea cuprea	7	6	6	6	5	6	6
F. ruficornis	*	-	*	10	9	9	9
Helophilus hybridus	5	5	5	9	9	9	7
H. pendulus	1	1	1	2	2	2	1
H. trivittatus	3	2	2	3	3	3	3
Heringia heringi	8·	8	8	9	9	9	8
H. senilis	-	10	10	10	9	10	10
Ischyrosyrphus glaucius	9	7	7	6	3	4	5
I. laternarius	8	6	7	9	6	6	5
Lejogaster metallina	4	5	5	6	7	6	5
L. splendida	7	8	8	-	-	9	8
Lejops vittata	10	*	10	-	-	-	10
Leucozona lucorum	8	4	6	4	3	5	5
Mallota cimbiciformis	-	*	*	-	-	-	*
M. fuciformis	10	*	10	10	10	10	10
Megasyrphus annulipes	-	7	8	9	6	7	7
Melangyna barbifrons	-	*	*	-	10	10	10
M. cincta	6	6	6	7	7	7	6
M. compositarum	-	-	-	-	9	9	9
M. guttata	8	7	7	10	10	10	8
M. labiatarum	-	-	-	-	7	8	8
M. lasiophthalma	9	8	8	9	8	8	8
M. quadrimaculata	10	8	9	*	*	*	9
M. triangulifera	8	7	7	8	8	8	8

	Flanders West	Flanders East	Flanders	Wallonia North	Wallonia South	Wallonia	Belgium
M. umbellatarum	7	7	7	8	7	7	7
Melanostoma mellinum	2	1	1	2	2	2	2
M. scalare	3	2	2	3	2	3	2
Merodon aeneus	-	-	-	-	10	10	10
M. avidus	10	*	10	*	10	10	10
M. equestris	5	5	5	3	4	3	4
M. ruficornis	-	10	10	-	10	10	10
M. rufus	-	-	-	-	10	10	10
Metasyrphus corollae	2	3	2	3	2	2	2
M. lapponicus	8	8	8	8	6	7	7
M. latifasciatus	6	6	6	6	5	6	6
M. latilunulatus	8	8	8	8	8	8	8
M. luniger	5	5	5	4	5	5	5
M. nielseni	10	-	10	-	9	9	9
M. nitens	-	-	-	10	7	8	8
Microdon devius	*	10	10	10	8	9	9
M. eggeri	-	8	9	10	6	7	8
M. mutabilis	-	9	9	-	9	10	9
Myathropa florea	2	1	2	1	1	1	1
Myolepta luteola	-	10	10	10	-	10	10
M. vara	*	10	10	-	*	*	10
Neoascia aenea	7	7	7	8	7	8	7
N. dispar	4	4	4	7	6	7	5
N. floralis	-	-	-	-	10	10	10
N. geniculata	7	8	8	-	10	10	8
N. interrupta	8	9	8	-	10	10	9
N. obliqua	-	8	9	9	9	9	9
N. podagrica	2	2	2	3	3	3	3
N. unifasciata	-	-	-	-	10	10	10
Neocnemodon brevidens	7	8	8	10	-	10	9
N. latitarsus	10	9	9	-	-	-	10
N. pubescens	8	8	8	9	8	8	8

	Flanders West	Flanders East	Flanders	Wallonia North	Wallonia South	Wallonia	Belgium
N. vitripennis	6	6	6	8	8	8	7
Olbiosyrphus laetus	-	-	-	-	10	10	10
Orthonevra brevicornis	10	8	8	8	8	8	8
O. elegans	-	*	*	*	9	9	10
O. geniculata	9	7	8	10	8	9	8
O. intermedia	*	*	*	-	-	-	*
O. nobilis	-	8	8	9	6	7	7
O. splendens	10	7	8	7	9	8	8
Paragus albifrons	-	-	-	-	9	10	10
P. bicolor	-	*	*	-	*	*	*
P. finitimus	*	10	10	-	9	9	9
P. flammeus	-	-	-	-	*	*	*
P. haemorrhous	8	7	7	8	7	8	7
P. majoranae	-	9	9	-	9	9	9
P. tibialis	8	*	9	-	10	10	9
Parasyrphus annulatus	10	8	8	-	7	8	8
P. lineola	-	7	8	8	4	5	6
P. macularis	-	-	-	-	8	8	9
P. malinellus	10	9	9	9	6	7	8
P. nigritarsis	-	9	9	10	10	10	9
P. punctulatus	7	7	7	8	6	7	7
P. vittiger	-	8	9	10	6	7	7
Parhelophilus consimilis	*	*	*	-	-	-	*
P. frutetorum	10	6	7	8	8	8	8
P. versicolor	8	7	7	9	9	9	8
Pelecocera tricincta	*	10	10	-	10	10	10
Pipiza austriaca	10	6	7	8	6	7	7
P. bimaculata	7	7	7	8	6	7	7
P. fenestrata	*	9	9	8	9	9	9
P. festiva	8	8	8	8	9	9	9
P. lugubris	8	7	7	9	8	8	8
P. luteitarsis	9	9	9	8	9	9	9

	Flanders West	Flanders East	Flanders	Wallonia North	Wallonia South	Wallonia	Belgium
P. noctiluca	7	6	6	7	6	6	6
P. notata	*	10	10	-	9	9	9
P. quadrimaculata	9	8	8	8	5	6	7
P. signata	10	9	9	-	9	10	9
Pipizella annulata	-	-	-	9	8	9	9
P. divicoi	-	-	-	10	9	9	10
P. maculipennis	-	10	10	-	-	-	10
P. pennina	-	-	-	-	10	10	10
P. varipes	6	5	5	7	5	5	5
P. virens	*	7	8	9	8	8	8
P. zeneggenensis	-	*	*	*	9	10	10
P. spec.	-	10	10	-	-	-	10
Platycheirus albimanus	3	2	2	2	2	2	2
P. ambiguus	9	8	8	10	9	9	9
P. amplus	-	-	-	-	9	10	10
P. angustatus	3	3	3	5	5	5	4
P. clypeatus	2	1	1	2	1	2	2
P. discimanus	10	*	10	*	10	10	10
P. europaeus	-	-	-	-	10	10	10
P. fulviventris	4	5	5	9	8	8	6
P. immarginatus	7	10	8	-	-	-	9
P. manicatus	6	5	5	5	5	5	5
P. occultus	-	-	-	-	9	9	9
P. ovalis	10	7	8	6	6	6	7
P. peltatus	2	1	1	2	3	2	2
P. perpallidus	10	9	9	-	*	*	10
P. scambus	4	5	4	8	6	7	5
P. scutatus	2	3	2	3	4	3	3
P. sticticus	-	10	10	-	*	*	10
P. tarsalis	10	8	8	8	8	8	8
Pocota personata	*	-	*	10	-	10	10
Psarus abdominalis	-	*	*	*	*	*	*

	Flanders West	Flanders East	Flanders	Wallonia North	Wallonia South	Wallonia	Belgium
Pyrophaena granditarsa	4	3	3	5	4	4	4
P. rosarum	8	4	6	6	5	6	6
Rhingia campestris	1	1	1	1	1	1	1
R. rostrata	-	-	-	*	*	*	*
Scaeva pyrastri	3	4	3	2	5	3	3
S. selenetica	6	4	5	4	4	4	4
Sericomyia lappona	-	7	8	9	6	6	7
S. silentis	8	6	7	7	4	5	5
Sphaerophoria batava	9	6	7	10	9	9	8
S. chongjini	-	-	-	-	9	10	10
S. fatarum	-	7	8	9	9	9	8
S. loewi	-	10	10	*	-	*	10
S. menthastri	10	9	9	10	6	6	7
S. philantus	-	8	9	*	8	9	9
S. rueppelli	8	7	8	8	9	9	8
S. scripta	3	2	2	2	2	2	2
S. taeniata	8	6	7	9	6	7	6
S. virgata	10	8	8	10	8	8	8
Sphegina clunipes	8	6	7	7	5	6	6
S. kimakowiczi	10	7	8	8	7	7	7
S. nigra	-	8	9	9	8	8	8
S. sibirica	-	-	-	-	9	9	9
S. verecunda	-	9	9	10	10	10	10
Spiximorpha subsessilis	-	*	*	9	9	9	9
Spilomyia saltuum	-	10	10	*	-	*	10
Syritta pipiens	1	1	1	2	2	2	1
Syrphus nitidifrons	-	-	-	-	9	10	10
S. ribesii	2	2	2	2	2	2	2
S. torvus	5	3	4	4	3	3	3
S. vitripennis	3	2	3	2	3	2	2
Temnostoma apiforme	-	-	-	-	8	9	9
T. bombylans	9	6	7	6	6	6	7

	Flanders West	Flanders East	Flanders	Wallonia North	Wallonia South	Wallonia	Belgium
T. vespiforme	9	6	7	6	5	6	6
Trichopsomyia carbonaria	-	-	-	-	9	9	9
T. flavitarse	8	7	8	-	8	9	8
T. lucida	10	8	8	-	9	10	9
Triglyphus primus	9	8	8	9	9	9	9
Tropidia fasciata	-	-	-	-	*	*	*
T. scita	3	4	4	8	10	8	6
Volucella bombylans	5	3	4	3	2	2	3
V. inanis	-	10	10	8	7	7	8
V. inflata	-	*	*	10	7	8	8
V. pellucens	6	4	5	4	1	2	3
V. zonaria	7	7	7	6	7	7	7
Xanthandrus comtus	7	8	7	10	8	9	8
Xanthogramma citrofasciatum	10	7	8	6	5	5	6
X. pedissequum	6	5	5	4	5	5	5
Xylota abiens	8	8	8	10	7	8	8
X. coeruliventris	-	-	-	-	6	7	8
X. curvipes	-	-	-	-	*	*	*
X. femorata	-	-	-	*	8	8	9
X. florum	8	6	7	7	6	6	6
X. ignava	-	-	-	-	8	9	9
X. lenta	7	6	7	6	6	6	6
X. meigeniana	-	8	8	10	8	9	8
X. nemorum	7	5	6	7	8	7	7
X. pigra	-	-	-	-	9	9	9
X. segnis	4	2	2	2	2	2	2
X. sylvarum	6	5	5	4	4	4	5
X. tarda	9	8	8	10	8	8	8
X. xanthocnema	9	8	8	9	9	9	8