Ferrantia

ISSN 1682 - 5519

Red List of the Vascular Plants of Luxembourg

Guy Colling
Thierry Helminger
Yves Krippel
Simone Schneider
Laura Daco

93 2025

Travaux scientifiques
du Musée national
d'histoire naturelle
Luxembourg

Ferrantia est une revue publiée à intervalles non réguliers par le Musée national d'histoire naturelle à Luxembourg. Elle fait suite, avec la même tomaison, aux Travaux scientifiques du Musée national d'histoire naturelle de Luxembourg parus entre 1981 et 1999.

Prix du volume: 20 €

Rédaction:
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L-2160 Luxembourg

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Page de couverture:

1. *Hymenophyllum tunbrigense* (L.) Smith - threat category EN, photo: Yves Krippel.
2. *Carex pulicaris* L. - threat category CR, photo: Simone Schneider.
3. *Campanula glomerata* L. - threat category VU, photo: Simone Schneider.

Citation:

Colling G., Helminger T., Krippel Y., Schneider S. & Daco L. 2025. - Red List of the Vascular Plants of Luxembourg. Ferrantia 93, Musée national d'histoire naturelle, Luxembourg, 65 pp.

Date de publication:
18 juillet 2025
(réception du manuscrit: 20.12.2024)

Impression:
Imprimerie reka

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myclimate.org/01-24-906817

 ISSN 1682-5519

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Guy Colling, Thierry Helminger, Yves Krippel, Simone Schneider & Laura Daco

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Red List of the Vascular Plants of Luxembourg

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Abstract

The present Red List is the second edition of the Red List of Vascular Plants of Luxembourg applying IUCN Red List categories at the national level. The checklist serving as the backbone of the Red List contains 1,423 native and established alien taxa. No threat category was assigned to the extant 172 Established Aliens (EA) and the 79 Data Deficient (DD) taxa. Out of the remaining 1,172 taxa for which a threat category was assigned, 8.9 % were assessed as Regionally Extinct (RE), 8.4 % as Critically Endangered (CR), 13.8 % as Endangered (EN), 13.0 % as Vulnerable (VU) and 9.9 % as Near Threatened (NT). In comparison to the previous Red List of Vascular Plants published in 2005 there was an increase of threatened taxa (CR + EN + VU) in Luxembourg from 30.4 % to 35.2 %.

Résumé

La présente Liste rouge est la deuxième édition de la Liste rouge des plantes vasculaires du Luxembourg qui applique les catégories de l'UICN au niveau national. La liste des taxons qui sert de base à la Liste rouge contient 1.423 taxons indigènes et naturalisés. Aucune catégorie de menace n'a été attribuée aux 172 taxons exotiques naturalisés (EA) et aux 79 taxons pour lesquels les données étaient insuffisantes (DD). Sur les 1.172 autres taxons pour lesquels une catégorie a été attribuée, 8,9 % sont considérés comme disparus au niveau régional (RE), 8,4 % comme en danger critique (CR), 13,8 % comme en danger (EN), 13,0 % comme vulnérables (VU) et 9,9 % comme quasi menacés (NT). Par rapport à la précédente Liste rouge des plantes vasculaires publiée en 2005, nous avons constaté une augmentation de taxons menacés (CR + EN + VU) au Luxembourg de 30,4 % à 35,2 %.

Zusammenfassung

Die vorliegende Rote Liste ist die zweite Ausgabe der Roten Liste der Gefäßpflanzen Luxemburgs, die die Kategorien der IUCN auf nationaler Ebene anwendet. Die Checkliste, die die Basis der Roten Liste bildet, enthält 1.423 einheimische und etablierte gebietsfremde Taxa. Den 172 etablierten gebietsfremden Taxa (EA) und den 79 Taxa mit ungenügender Datengrundlage (DD) wurde keine Gefährdungskategorie zugewiesen. Von den bewerteten 1.172 Taxa wurden 8,9 % als regional ausgestorben (RE), 8,4 % als vom Aussterben bedroht (CR), 13,8 % als stark gefährdet (EN), 13,0 % als gefährdet (VU) und 9,9 % als potenziell gefährdet (NT) eingestuft. Im Vergleich zur vorherigen, 2005 veröffentlichten Roten Liste der Gefäßpflanzen gab es einen Anstieg der bedrohten Taxa (CR + EN + VU) in Luxemburg von 30,4 % auf 35,2 %.

1 Introduction

Red Lists are an essential tool in the field of conservation, helping to identify and address the most urgent threats to biodiversity. They provide a systematic and science-based approach to assess and prioritise species in need of conservation action, prevent species extinctions, and protect biodiversity. Red Lists are important both at the global and at the regional level (Rodrigues et al. 2006; Fitzpatrick et al. 2007; Miller et al. 2007; Bilz et al. 2011). At the global level, Red Lists highlight plant species that are threatened with extinction on a global scale, raising awareness about the importance of preserving global biodiversity. At regional or national levels, they provide specific data and priorities for local conservation efforts. The International Union for Conservation of Nature (IUCN) provides specific rules and guidelines for assessing species for Red Lists and their categories and criteria are internationally recognized and widely used standards for assessing the extinction risk of species. The first Red List of Vascular Plants of Luxembourg, published in 2005 (Colling 2005), applied the IUCN threat categories for the first time at the national level for Luxembourg. We now provide a new assessment for the vascular plants of Luxembourg, as regular updates of Red Lists are crucial to accurately reflect the changing status of species and ensure that conservation efforts are informed by the most current information, thus allowing for more effective and responsive conservation strategies and policies.

2 Material and methods

2.1 Checklist of vascular plants

Red Lists should be based on an up-to-date checklist of plant taxa specific to the geographical region under study. We conducted a thorough revision of the published checklist of vascular plant species of Luxembourg (Colling 2005). The current checklist includes all documented vascular plant species in Luxembourg, verified through valid LUX herbarium sheets, and classifies them as either native taxa (including archaeophytes) or established aliens (see below for details). Historical herbarium sheets of the 19th century were only considered when a precise collection locality was indicated. As the LUX herbarium was recently digitised (Helminger, Weber & Braun 2020), we had online access to most LUX herbarium sheets via the Recorder LUX 6.0 database used at the Luxembourg National Natural History Museum (MnhnL) for the management of natural history collection data (Colling, Walisch & Copp 2007). Taxa with only historical literature records (Tinant 1836; Koltz 1873, 1879) were not considered, except in special cases such as *Osmunda regalis*, which was mentioned by Koltz (1879) but whose presence was only confirmed at the end of the 20th century (Reichling 1990; Colling 2005). For each taxon of the checklist, we defined the year of its first record (first observation in the wild) in Luxembourg using data from the LUX herbarium and occurrence data from the online data portal of the MnhnL (mdata.mnhn.lu). For 56 established alien plant taxa considered to be invasive in Luxembourg, we used the first records established by Ries & Krippel (2021). The list of pteridophytes integrated into the present checklist is based on the online checklist of pteridophytes by Krippel (2024). Nomenclature of the checklist follows Verloove & Van Rossum (2024).

Archaeophytes, Established Aliens and adventive taxa

We did not distinguish between native plants and archaeophytes in the establishment of the present checklist. Archaeophytes are considered non-native species introduced in historical times, prior to Christopher Columbus's arrival in the New World in 1492, which marked the beginning of the Columbian Exchange (Crosby 1972). Neophytes or Established Aliens (EA) are considered to be plant taxa that have become naturalised (having self-sustaining populations) in more recent times.

In contrast to the previous version of the Red List (Colling 2005), hereafter referred to as "2005 Red List", we did not assign a threat category to EA taxa. Casual plant taxa recorded in Luxembourg only for a short time period (≤ 10 years, see Pyšek et al. 2004) were considered as adventive taxa and were thus not included in the present Red List. The following plant taxa listed in the 2005 Red List were now classified as adventive taxa (see Verloove & Van Rossum 2024) and were thus excluded from the new version: *Asparagus*

officinalis, *Bromus lepidus*, *Centaurea repens*, *Centaurea stoebe*, *Cephalaria gigantea*, *Conringia orientalis*, *Crepis sancta* subsp. *nemausensis*, *Cynodon dactylon*, *Herniaria hirsuta*, *Linaria supina*, *Mimulus moschatus*, *Moneses uniflora*, *Symphytum ×uplandicum*, *Trifolium montanum*, *Vicia lutea* and *Xanthium strumarium*.

Microspecies, hybrids and infraspecific taxa

In the genus *Taraxacum* with a large number of microspecies, the list of taxa integrated into the present checklist is based on the 2005 Red List. The presence of these taxa was confirmed by historical LUX herbarium specimens and by literature (Reichling 1981). However, the current day occurrence of these mostly apomictic taxa in Luxembourg is a question of debate as we have no recent data for the time period considered (2005 - 2025). The main reason is a lack of specialists able to identify these taxa. For the genus *Rubus* the published checklist (Helminger 2009) was integrated into the present Red List. Due to the lack of current occurrence data, many *Rubus* L. subg. *Rubus* taxa as well as *Taraxacum* taxa were considered as DD. For the other micro-species groups *Hieracium*, *Alchemilla*, *Pilosella*, *Sorbus* and *Ranunculus auricomus* only taxa with known recent occurrences were listed in the present Red List.

Infraspecific taxa like subspecies, varieties, and forms were in general not considered for the checklist except when their conservation status could be evaluated based on recent observations. The same criteria were applied to species hybrids. A systematic inventory of hybrids in pteridophytes allowed an integration of these taxa into the checklist and an assignment to a threat category (see Krippel 2023, 2024). The microspecies *Sorbus semiincisa* included in the 2005 Red List was excluded from the present version of the checklist since its presence was not confirmed for the area covered by the flora of Verloove & Van Rossum (2024).

2.2 Assessment of IUCN threat categories

IUCN threat categories

We applied the Guidelines for Using the IUCN Red List Categories and Criteria (IUCN Standards and Petitions Committee 2024) and followed the guidelines for the application of the IUCN Red List criteria at a regional and national level (Gärdenfors et al. 2001; IUCN 2012a). The IUCN employs five criteria (A, B, C, D and E) under which a taxon can be evaluated (see Appendix 1). Criterion B (geographic range size and fragmentation, few locations, decline, or fluctuations) is the most widely used, as occurrence data are the only information available for many taxa (Dauby et al. 2017), including those in Luxembourg. When sufficient data were not available for an assessment, taxa were listed as Data Deficient (DD) (IUCN Standards and Petitions Committee 2024). If occurrence data were present, taxa were assigned to one of the three threat categories (Critically Endangered (CR), Endangered (EN), Vulnerable (VU)), or to the categories Near Threatened (NT) or Least Concern (LC). Taxa were considered Regionally Extinct (RE) when the last known observation was older than 30 years.

Occurrence data considered for the assessment

The data on vascular plant taxa occurrences used for the assessment were downloaded from the MnhnL data portal (mdata.mnhn.lu, accessed on 17.01.2022) with a temporal filter of the observation dates set to > 01.01.2005 and a geographical filter of the data using the Luxembourg contour shape file. We also applied a taxonomic filter by using a provisional checklist based on all taxa of the 2005 Red List and new plant taxa observed after 2004 that were considered natives or established aliens. The downloaded data file from mdata.mnhn.lu contained 487,036 occurrences of 1,181 different taxa of vascular plants observed in Luxembourg between 01.01.2005 and 17.01.2022. We used the following data sources available on mdata.mnhn.lu: Recorder-Lux database (MnhnL 2022), iNaturalist (iNaturalist 2022) and GBIF (GBIF.org 2022). In recent years, data contributed by citizen science projects on the platforms iNaturalist.lu and data.mnhn.lu have become a very valuable source of plant occurrence data in addition to the observations contributed by professional botanists. Observations of plants from translocation actions were also part of the dataset. We did not distinguish between natural and translocated populations for the assessment of the threat status of the target plant species.

For occurrences of taxa assessed as not threatened or near threatened (LC or NT), as well as those assessed as VU and EN, we relied on the validation procedures integrated into iNaturalist.lu and data.mnhn.lu. iNaturalist provides a worldwide network of naturalists validating data whereas on data.mnhn.lu the validation process is done by professional botanists and by voluntary scientific collaborators of the MnhnL. For occurrences of CR and RE taxa, we checked the citizen science data from iNaturalist. For example, we confirmed the identification of an occurrence of the rare orchid species *Orchis simia,* which was considered to be RE (Colling 2005) by checking the photographic material that was provided when the observation was made on iNaturalist.lu in 2022. However, when we could not validate the taxonomic determination with the information provided on iNaturalist.lu, we visited the location or contacted the author of the observation to ask for additional photographic material or for herbarium specimens. For some species, like the rare *Carex elata,* we considered only observations occurring within its known historical distribution area. *C. elata* can easily be mistaken with the much more common *C. nigra* when it grows in tufts in fallow wetlands. Whereas *C. nigra* is common in the northern part of Luxembourg, there are no historical records or herbarium specimens of *C. elata* from that area. Therefore, we did not consider occurrences of *C. elata* from the northern region of Luxembourg.

Automated provisional assignment

We used the *R* package *ConR* (Dauby et al. 2017) for a provisional automated assignment of the plant taxa to one of the IUCN threat categories. *ConR* uses a data input file with geographic coordinates, taxon name and year of observation and calculates the extent of occurrence and the area of occupancy, estimates the number of locations and subpopulations, creates species distribution maps and offers preliminary estimates of IUCN categories based on these results. The extent of occurrence (EOO) is defined as "the area contained within the shortest continuous imaginary boundary which can be drawn to encompass all the known, inferred or projected sites of present occurrence of a taxon, excluding cases of vagrancy" (IUCN Standards and Petitions Committee 2024). In general, the EOO is measured by a minimum convex polygon (IUCN Standards and Petitions Committee 2024). EOO is used in criterion B1 to assess the extinction risk. However, in such a small country like Luxembourg this criterion cannot be used as every plant taxa in Luxembourg (with an area of 2,586 km^2) would automatically have an EOO of less than 5,000 km^2 and would thus be classified at least to be EN (see IUCN 2012b). For that reason, we focussed on criterion B2 which is based on the area of occupancy (AOO) and the number of locations. The IUCN defines the area of occupancy (AOO) as "the area within its 'extent of occurrence' which is occupied by a taxon, excluding cases of vagrancy" (IUCN Standards and Petitions Committee 2024). It reflects that a taxon will not necessarily occur in the whole area defined by the EOO because there are unsuitable areas and/or the taxon went extinct at certain locations. We used the default grid cell size of 2 × 2 km to calculate the AOO. A location is defined as "a geographically or ecologically distinct area in which a single threatening event can rapidly affect all individuals of the taxon present" (IUCN Standards and Petitions Committee 2024). Subpopulations are defined as "geographically or otherwise distinct groups in the population between which there is little demographic or genetic exchange" (IUCN Standards and Petitions Committee 2024).

The number of locations depends on the scale, or the size of the grid cell considered (Dauby et al. 2017). We conducted preliminary tests with *ConR*, using a reduced dataset from the 2005 Red List and grid resolutions of 1 km, 5 km, and 10 km. This test revealed that a grid resolution of 5 km produced automatic assignments most closely aligned with the manual assignments from the 2005 Red List. The number of taxa assigned to the categories CR, EN and VU by *ConR* for the reduced dataset was very similar to the number of threatened plant taxa in the 2005 Red List: 33 taxa for *ConR* and 34 taxa for the 2005 Red List (including the category extremely rare R abolished in the present Red List). Eventually, we used the function *IUCN eval* of *ConR* with default parameters except for the location grid size which was set to 5 km for the whole dataset. A preliminary threat category was assessed with *ConR* for each taxon of the dataset using the criterion B2 AOO (IUCN Standards and Petitions Committee 2024). To validate criterion B, *ConR* also assumes a continuing future decline in habitat quality (condition (b) under criterion B).

Final assessment

The provisional automated assignments to IUCN categories using *ConR* were supplemented with additional criteria to achieve the final assessment. When information about the reduction in population size since 2005 was available, we used criterion A (population size reduction) or criterion D (very small or restricted population) in addition to criterion B (IUCN Standards and Petitions Committee 2024). As the automated assessment using *ConR* is not able to distinguish between LC and NT categories, we assigned taxa to the NT category when a substantial reduction (20 % at least) in population size (criterion A) had occurred since 2005. Recently published records of rare and endangered plant species and newly Established Aliens (see Krippel & Colling 2006, 2008, 2010, 2012, 2014, 2016; Krippel, Helminger & Colling 2018, 2020; Krippel & Helminger 2022; Wolff & Krippel 2022a, 2022b) and data of vegetation monitoring projects (SICONA 2024) were also considered for the final assessment. Changes of threat categories during the final assessment were made based on evaluations by the co-authors concerning changes in population sizes (criterion A), small population sizes and their decline (Criterion C), and very small or restricted populations (Criterion D) or on new recent occurrence data not yet entered into the database.

The IUCN also requires adjusting the assessment to obtain the final regional Red List categories by assessing the effects of extra-regional populations on the regional ones. In our case, as the available data are very limited, we estimated that it was unlikely that populations received significant immigration of propagules from neighbouring populations in the Greater Region, so no changes were made to the categories in this regard.

2.3 Habitat types

All taxa from the checklist were assigned to the habitat type (Tab. 1) where they typically occur. The habitat types are identical to the ones used in the 2005 Red List (Colling 2005) but some taxa were assigned to different habitats due to additional information about their ecological niche.

Tab. 1: Habitat types assigned to the taxa (see Colling 2005).

Habitat type	Abbreviation
Aquatic habitats and springs	AQU
Dry and mesophilic grasslands and heathlands	DRY
Woodlands, forest fringes and cuttings	FOR
Freshwater margins and damp mud	FRE
Intensively managed grasslands	GRA
Marshes, swamps and wet grasslands	MAR
Rocks and screes	ROC
Fallow land, ruderal communities and arable fields	RUD

2.4 Statistical analyses

To compare the results of the present Red List to the 2005 Red List, we calculated the proportions of plant taxa in the different threat categories excluding EA, DD and Not Evaluated (NE) taxa in both lists. We also calculated the frequencies and proportions of DD, NE, and EA including all taxa for both versions.

We also used frequency analysis to compare the present Red List with the ones from the Greater Region including Saarland, Wallonia, Rhineland-Palatinate, and Lorraine (Schneider et al. 2020; Saintenoy-Simon et al. 2006; Hanselmann et al. 2023; Bonassi et al. 2015 respectively) for the proportions of RE plant taxa excluding DD, NE, and EA taxa.

We used a binomial logistic regression to study the relationship between the estimated year of the first record of a new taxon for Luxembourg by including habitat type as a predictor and its probability to be an EA using the function *glm* in *R* version 4.0.3. The predicted probabilities were plotted with the function *plotmodel* of the *R* package *sjplot* version 2.8.10 (Lüdecke 2023). We tested whether the proportion of threatened plant taxa (CR + EN + VU) and the proportion of EA

differed significantly among habitat types using ANOVA in SPSS version 25.0 (IBM Corp., Armonk, NY, USA). To test whether the proportions of threatened plant taxa differed significantly among subsets of habitat types, we used a post-hoc Tukey's test.

To evaluate the trend in extinction risks, we calculated the Red List Index (RLI) (Bubb et al. 2009) for both the 2005 and the present Red List. The comparison between RLIs is based on the changes of species between categories by assigning a weight between 0 (for LC) and 5 (for RE) to each assessed taxon depending on their threat category, excluding DD and NE taxa. We chose to assign the same value to the taxa with the category R than to the CR taxa. The RLI varies between 0 and 1 and is smaller when threat statuses are higher, so if the RLI decreases between two time periods, the extinction risk of the assessed taxa increases.

3 Results

3.1 Checklist and assessment of threat categories

The updated checklist of vascular plants lists 1,423 taxa. In comparison to the 2005 Red List, the number of vascular plant taxa increased by 100 in the checklist, as 133 taxa were newly added, and 33 taxa were not taken over from the 2005 Red List. The additional taxa include newly Established Aliens, taxa for which an evaluation of historical data or specimens brought new evidence to include them in the checklist, taxonomic changes, and some additional microspecies in the genus *Rubus* (see Helminger 2009). The 33 taxa from the 2005 checklist not integrated in the present one were mainly adventives or were eliminated due to taxonomical changes in nomenclature (see Verloove & Van Rossum 2024).

Out of the 983 taxa automatically assessed with *ConR*, 105 taxa were assigned to a different threat category during the final assessment. The threat categories were changed by applying other criteria in addition to criterion B, which indicates that *ConR* can provide an assignment of a large proportion (89.3 %) of taxa using criterion B when the grid resolution of locations is adapted to the study region. The additional manual application of criteria A, C or D often resulted in a higher threat category (e.g. from VU to EN) when there was information about a substantial reduction in population sizes (criterion A) or when current information about population sizes (criteria C or D) were available.

3.2 Comparison between the present Red List and the 2005 Red List

In comparison to the 2005 Red List, the number of RE vascular plant taxa increased from 88 to 104 taxa, corresponding to an increase from 7.9 % to 8.9 % of RE taxa in the native flora (Tab. 2). However, 14 native taxa considered to be RE in 2005 were observed during the period in between the two Red List assessments and are now assessed as CR (ten taxa, e.g. *Montia arvensis, Parietaria officinalis*), EN (two taxa, e.g. *Potamogeton trichoides*) or VU (two taxa, e.g. *Ranunculus lingua*).

A total number of 14 plant taxa assigned to the category CR and 8 taxa assigned to the former category Extremely Rare (R) in 2005 were now considered RE. These taxa include ruderal species like *Filago germanica*, *Scandix pecten-veneris* and *Silene dichotoma*, but also species of dry grasslands and heathlands like *Prunella grandiflora*, *Trifolium alpestre*, *Vaccinium vitis-idaea*. Several species of wet grasslands, swamps and freshwater margins like *Blysmus compressus*, *Carex diandra*, *Parnassia palustris*, *Salix repens* and *Senecio sarracenicus* also went extinct together with some forest species like *Rosa stylosa* and *Vicia pisiformis*. *Huperzia selago* was known only as a single individual from one location which was recently destroyed. Two taxa considered to be Endangered (EN) in 2005 are now classified as RE: *Allium rotundum,* and *Juncus subnodulosus*. Also, *Carex strigosa* and *Agrostis vinealis*, considered to be VU and NT in 2005 respectively, are now considered to be RE.

In the 2005 Red List, the category R existing in the pre-2001 IUCN criteria was used. This category characterised taxa with few and small populations which would not classify for CR, EN, VU, or NT. In the updated IUCN Red List Categories and Criteria (IUCN 2001) category R was abolished

Tab. 2: Comparison of threat categories between the 2005 Red List and the present Red List including 95 apomictic microspecies in the genera *Taraxacum* and *Rubus*.

RE = Regionally Extinct, CR = Critically Endangered, EN = Endangered, VU = Vulnerable, NT = Near Threatened, LC = Least Concern, R = Extremely Rare, DD = Data Deficient, NE = Not Evaluated, EA = Established Alien. Values in a) indicate the frequencies and proportions of plant taxa per threat category when EA, DD and NE were excluded from the total number of taxa. Values in b) include the frequencies and proportions of DD, NE and EA taxa for both versions.

Threat category	Frequency		Percentage	
	2005 Red List	Present Red List	2005 Red List	Present Red List
a)				
RE	88	104	7.9 %	8.9 %
CR	113	98	10.1 %	8.4 %
EN	118	162	10.6 %	13.8 %
VU	109	152	9.7 %	13.0 %
NT	36	116	3.2 %	9.9 %
LC	585	540	52.3 %	46.1 %
R	69	-	6.2 %	-
Total Excluding EA+DD+NE	1,118	1,172	100 %	100 %
b)				
Total Excluding EA+DD+NE	1,118	1,172	84.5 %	82.4 %
DD	2	79	0.2 %	5.6 %
NE	85	-	6.4 %	-
EA	118	172	8.9 %	12.1 %
Total taxa	1,323	1,423	100 %	100 %

and all taxa classified as such were now assessed to the current IUCN threat categories. *Carex humilis*, *Dactylis glomerata* subsp. *lobata*, *Diplotaxis muralis*, *Eleocharis ovata*, *Laserpitium latifolium*, *Pyrola media* and *Sorbus latifolia* were classified as R in the 2005 Red List and are now considered to be RE. These regional extinctions indicate that some taxa with few and small populations formerly assigned to category R would have been considered as CR if the current guidelines were used.

The proportion of CR plant taxa decreased from 10.1 % to 8.4 % (Tab. 2). On one hand, 14 taxa assessed as CR in 2005 are now considered to be RE, on the other hand systematic field work (e.g. biotope inventory, monitoring of extensively

managed grasslands) carried out in the two last decades revealed new sites for rare and endangered taxa. Moreover, conservation measures including translocations improved the conservation status of some taxa like *Arnica montana* and *Scutellaria minor*.

The comparison between the two versions of the Red List also showed an alarming increase in the proportion of native plant taxa assessed as EN (from 10.6 % to 13.8 %), VU (from 9.7 % to 13.0 %) and NT (from 3.2 % to 9.9 %) (Tab. 2), indicating that for an increasing proportion of vascular plant taxa the number of locations, the area of occupancy, or the population sizes are small or declining in Luxembourg. Overall, the proportion of threatened native plant taxa (CR + EN + VU) increased from 30.4 % in the 2005 Red List to 35.2 % in the present Red List, resulting in a decrease in the proportion of not threatened taxa (LC) from 52.3 % to 46.1 %.

The number of EA taxa increased from 118 in the 2005 Red List to 172 taxa in the present Red List (Tab. 2). Fourteen EA taxa in the 2005 Red List are no longer listed in the present Red List (e. g. *Symphytum ×uplandicum* and *Xanthium strumarium*) as they are now considered to be adventive. Other newly added EA were either new arrivals or taxa classified as native in the 2005 Red List. The proportion of EA taxa increased from 8.9 % to 12.1 %. The total number of EA in the present Red List was much larger than the number of RE plant taxa (172 EA vs. 104 RE, Tab. 2) indicating a clear trend towards a biotic homogenization of the Luxembourgish flora.

The Red List Index (RLI) was calculated for the 1,098 taxa evaluated both in the 2005 Red List and in the present Red List. Between 2005 and 2025, the RLI varied from 0.6858 to 0.6862, indicating no overall change in the national extinction risk for taxa of the flora of vascular plants of Luxembourg. Of these 1,098 taxa, most taxa did not change their threat category (64 %). A similar proportion of taxa showed an increase (16 %) or a decrease (20 %) in threat categories (Fig. 1).

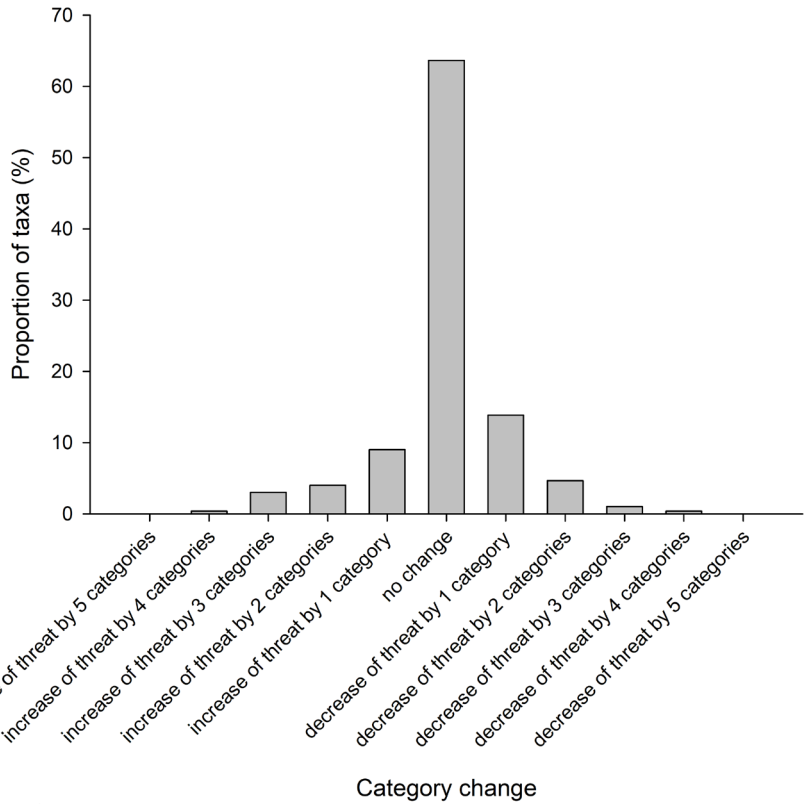

Fig. 1: Proportion of taxa per categorical changes in threat category between the 2005 Red List and the present Red List.

3.3 Luxembourg and the Greater Region

The Greater Region covers 65,406 km² (STATEC 2024) and comprises the territories Lorraine in the French region Grand Est, Wallonia, the Federation Wallonia-Brussels and Ostbelgien in Belgium, the federal states Saarland and Rhineland-Palatinate in Germany as well as the Grand Duchy of Luxembourg (Mémorial 2013). The different regions all have Red Lists of Vascular Plants (Schneider et al. 2020; Saintenoy-Simon et al. 2006; Bonassi et al. 2015; Hanselmann et al. 2023) allowing us to make a comparison of the proportion of RE vascular plant taxa among the territories of the Greater Region (Tab. 3). The proportion of RE taxa of the federal territory of Germany (Metzing et al. 2018) was added for comparison purposes. Smaller study areas like Luxembourg and the similarly sized Saarland had a higher proportion of RE plant taxa (8.9 % and 11.1 %, respectively) than larger regions (Tab. 3). This confirms that when comparing threat levels across different regions or countries, it is essential to account for differences in the size of the study areas (see Colling 2005).

Tab. 3: Proportions of Regionally Extinct (RE) vascular plant taxa in the Greater Region per country/region.

The proportions of RE taxa were calculated by excluding Established Aliens (EA), Not Evaluated (NE) and Data Deficient (DD) taxa. (1) Schneider et al. 2020, (2) Delescaille & Saintenoy-Simon 2006, (3) Saintenoy-Simon et al. 2006, (4) Hanselmann et al. 2023, (5) Bonassi et al. 2015, (6) Metzing et al. 2018.

Country/region	Area (km²)	RE (%)	Number of plant taxa
Saarland (DE)	2,570	11.1	1,335 (1)
Luxembourg	2,585	8.9	1,172
Wallonia (BE)	16,901	8.5	1,351 (2,3)
Rhineland-Palatinate (DE)	19,854	4.9	1,783 (4)
Lorraine (FR)	23,547	2.2	1,428 (5)
Germany	357,022	2.0	3,282 (6)

3.4 Plant diversity and threat assessments in different habitat types

The two habitat types, FOR and RUD, hosted by far the highest number of plant taxa (404 and 342 taxa, respectively) and made the greatest contribution to vascular plant biodiversity in Luxembourg, accounting for 52.4 % of the local flora (Tab. 4a). Another important habitat for plant diversity are DRY habitats. Thus, the three habitat types DRY, FOR, and RUD, harboured a total of 970 plant taxa, representing 68.2 % of the local flora (Tab. 4a).

The number and proportions of plant taxa in each threat category varied strongly across different habitat types (Tab. 4a). The highest percentages of RE taxa in Luxembourg were found in RUD and DRY habitats (27.3 % and 23.6 %, respectively). Similarly, the highest proportions of CR plant taxa were observed in DRY and RUD habitats (25.8 % and 20.6 %, respectively). FOR habitats contained the highest proportion of LC plant taxa (32.3 %).

In comparison to the 2005 Red List, the number of RE vascular plant taxa in the present Red List increased in DRY, FOR, and MAR, (from 21 to 26, from 7 to 17, and from 10 to 18 respectively, Tab. 4a, Appendix 1 Tab. A1), suggesting that taxa in these habitats became increasingly threatened.

The proportion of threatened plant taxa (CR + EN + VU) differed significantly among habitat types ($F_{7,1415} = 9.7$, $P < 0.001$; Tab. 5). More than 40 % of species occurring in the habitats AQU, DRY and FRE were considered threatened (Tab. 4b, Tab. 5). FRE and AQU habitats had a significantly higher proportion of threatened plant taxa than FOR, RUD and GRA (Tab. 5). Around 30 to 40 % of plant taxa in ROC, MAR and DRY habitats were considered to be threatened plant taxa but these proportions did not differ significantly either from the subset with a high proportion of threatened plant species AQU and FRE nor from FOR and RUD habitats with a lower proportion. GRA habitats harboured no threatened plant taxa (Tab. 4b, Tab. 5).

Tab. 4: a) Habitat types per threat category. The proportions (and numbers) of plant taxa are indicated per habitat type for each threat category. The proportion and number of EA per habitat type is also indicated. **b)** Threat categories per habitat types. The proportions (and numbers) of plant taxa per threat category for each habitat type are indicated. The total proportion and number of EA is also indicated for each habitat type. For habitat abbreviations see Tab. 1. RE = Regionally Extinct, CR = Critically Endangered, EN = Endangered, VU = Vulnerable, NT = Near Threatened, LC = Least Concern, DD = Data Deficient, EA = Established Aliens. The two highest proportions per row are highlighted in bold.

a)	RE	CR	EN	VU	NT	LC	DD	Total Natives	EA	Total with EA
AQU	1.8 % (2)	**8.2 %** (8)	**6.1 %** (10)	5.3 % (8)	**6.1 %** (7)	2.2 % (12)	3.8 % (3)	4.0 % (50)	4.7 % (8)	4.1 % (58)
DRY	23.6 % (26)	**25.8 %** (25)	15.2 % (25)	**26.3 %** (40)	22.6 % (26)	14.1 % (76)	3.8 % (3)	17.7 % (221)	1.7 % (3)	15.7 % (224)
FOR	15.5 % (17)	17.5 % (17)	28.7 % (47)	18.4 % (28)	**40.0 %** (46)	32.3 % (174)	**48.1 %** (38)	29.3 % (366)	22.1 % (38)	28.4 % (404)
FRE	6.4 % (8)	**12.4 %** (12)	**9.1 %** (15)	5.1 % (7)	4.7 % (6)	3.5 % (19)	5.1 % (4)	5.7 % (71)	3.5 % (6)	5.4 % (77)
GRA	0.8 % (1)	0.0 % (0)	0.0 % (0)	0.0 % (0)	0.8 % (1)	**7.6 %** (41)	**20.3 %** (16)	4.7 % (59)	1.2 % (2)	4.3 % (61)
MAR	**16.4 %** (18)	10.3 % (10)	9.8 % (16)	**15.1 %** (23)	10.4 % (12)	13.3 % (72)	2.5 % (2)	12.2 % (153)	1.2 % (2)	10.9 % (155)
ROC	6.4 % (7)	6.2 % (6)	**9.3 %** (15)	8.6 % (13)	6.1 % (7)	6.1 % (33)	**15.2 %** (12)	7.4 % (92)	5.8 % (10)	7.2 % (102)
RUD	**27.3 %** (30)	20.6 % (20)	20.9 % (34)	**21.7 %** (33)	9.6 % (11)	21.0 % (113)	1.63 % (1)	19.1 % (239) (	59.9 % (103)	24.0 % (342)
Total	100 % (109)	100 % (98)	100 % (162)	100 % (152)	100 % (116)	100 % (540)	100 % (79)	100 % (1,251)	100 % (172)	100 % (1,423)

b)	AQU	DRY	FOR	FRE	GRA	MAR	ROC	RUD
RE	3.4 % (2)	**11.6 %** (26)	4.2 % (17)	10.4 % (8)	1.6 % (1)	**11.6 %** (18)	7.6 % (7)	8.8 % (30)
CR	**13.8 %** (8)	11.2 % (25)	4.2 % (17)	**15.6 %** (12)	0.0 % (0)	6.5 % (10)	6.5 % (6)	5.8 % (20)
EN	**17.2 %** (10)	11.2 % (25)	11.6 % (47)	**19.5 %** (15)	0.0 % (0)	10.3 % (16)	14.7 % (15)	14.2 % (34)
VU	13.8 % (8)	**17.9 %** (40)	6.9 % (28)	9.1 % (7)	0.0 % (0)	**14.8 %** (23)	12.7 % (13)	9.6 % (33)
NT	**12.1 %** (7)	**11.6 %** (26)	11.4 % (46)	7.8 % (6)	1.6 % (1)	7.7 % (12)	6.9 % (7)	4.6 % (11)
LC	20.7 % (12)	33.9 % (76)	43.1 % (174)	24.7 % (19)	**67.2** % (41)	**46.5 %** (72)	32.4 % (33)	33.0 % (113)
DD	5.2 % (3)	1.3 % (3)	9.4 % (38)	5.2 % (4)	**26.2 %** (16)	1.3 % (2)	**11.8 %** (12)	0.3 % (1)
Total Natives	86.2 % (50)	**98.7 %** (221)	90.6 % (366)	92.2 % (71)	96.7 % (59)	**98.7 %** (153)	90.2 % (92)	69.9 % (239)
EA	**13.8 %** (8)	1.3 % (3)	9.4 % (38)	7.8 % (6)	3.3 % (2)	1.3 % (2)	9.8 % (10)	**30.1** % (103)
Total with EA	100 % (58)	100 % (224)	100 % (404)	100 % (77)	100 % (61)	100 % (155)	100 % (102)	100 % (342)

Tab. 5: Post-hoc Tukey's test comparing proportions of threatened plant taxa (CR + EN + VU) among subsets of habitat types.

For habitat abbreviations see Tab. 1. Proportions with different superscript letters are significantly different ($P < 0.05$).

	Proportion of threatened plant taxa (%)		
Habitat type	**low**	**intermediate**	**high**
GRA	0[a]		
FOR		23[b]	
RUD		25[b]	
MAR		32[bc]	32[bc]
ROC		33[bc]	33[bc]
DRY		40[bc]	40[bc]
FRE			44[c]
AQU			45[c]

3.5 Established Aliens and habitats

The proportion of EA taxa strongly differed among habitat types (ANOVA, $F_{7,1415} = 24.7$, $P < 0.001$). The highest proportion of EA per habitat calculated as the ratio between the number of EA per habitat and the total number of taxa per habitat was found in RUD habitats (30.1 %, Tab. 4b). This proportion has increased in comparison to the 2005 Red List (21.7 %, Tab. A1). In contrast, very low proportions of EA were found in DRY and MAR habitats (1.3 %, Tab. 4b) indicating that these habitats are much more resistant to invasions by neophytes. Intensively managed grasslands (GRA) had also a very low proportion of EA (3.3 %).

The probability that a new taxon recorded for the first time in Luxembourg is an EA increased over time, with the year of the first record (Appendix 2 Tab. A2, $P < 0.001$). More recently discovered taxa are much more likely to be EA taxa than taxa

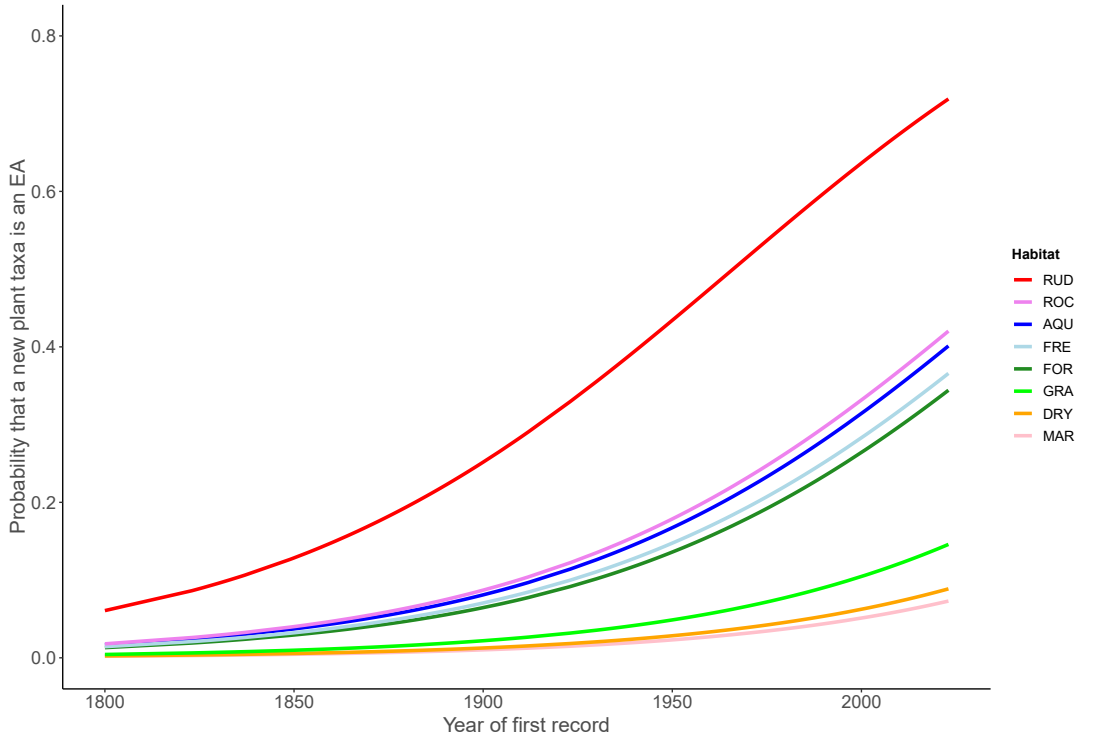

Fig. 2: Binary logistic regression showing the predicted probabilities that a newly discovered taxon is an Established Alien (EA) in relation to the year of its first record. For detailed results see Appendix 2 Tab. A2 and for habitat abbreviations see Tab. 1.

with older first records. However, this probability differed among habitat types (Fig. 2, Appendix 2 Tab. A2). DRY, MAR and GRA habitats had a very low increase in the probability (see coefficients in Appendix 2 Tab. A2 and Fig. 2) of taxa being an EA in relation to the year of first record and can thus be considered highly resistant to the establishment of alien plants, whereas RUD habitats were highly favourable to the establishment of EA over time. ROC, AQU, FRE, and FOR habitats exhibited a moderate increase in the probability of new plant taxa being classified as EA relative to the year of their first record (Fig. 2).

3.6 Comments on ferns and lycophytes

Out of the 64 taxa of ferns, including horsetails (PPG I 2016), and lycophytes (Krippel 2024), 14.1 % are RE, 10.9 % CR, 10.9 % EN, 9.4 % VU, 3.1 % NT and 35.9 % LC. For 9.4 % of the taxa the occurrence data is deficient (DD) and 6.3 % of all pteridophytes are considered to be Established Aliens (EA). Over the last decades, intensive field work allowed to fill some knowledge gaps especially on subspecies and hybrids of ferns (Krippel 2012).

The sandstone area called "Petite Suisse luxembourgeoise" in the Eastern part of the country is a hotspot of pteridophyte diversity (Krippel 2013; Schneider et al. 2019). More than 90 % of all pteridophyte taxa known in Luxembourg occur in this area, which is internationally known for its relict populations of the endangered filmy-fern *Hymenophyllum tunbrigense*. Despite the loss of several populations over the last decades, *H. tunbrigense* is persisting in most of the remaining populations and was classified as EN. However, ongoing climate change with an increasing frequency of long drought periods and extremely high temperatures could negatively affect the survival of the filmy fern in the future (Colling, Helminger & Meisch 2005). The other species of filmy-ferns *Vandenboschia speciosa* occurs in Luxemburg only as independent gametophytes growing sheltered in rock crevices of the Luxembourg sandstone and the Devonian schists (Krippel 2005, 2009) and was assessed as LC.

Woodland ferns and fern taxa growing on rock faces and blocks in woodland areas are generally in a good conservation status and were mostly assessed as LC, with some exceptions in the *Dryopteris affinis* aggregate. However, the rare *Polystichum setiferum* and *P.* ×*bicknellii* were both assessed as EN in the present Red List and *Oreopteris limbosperma* changed from VU in the 2005 Red List to EN. Threat statuses increased for ferns growing on rocks: *Polystichum lonchitis* changed from EN to CR, *Asplenium septentrionale* from LC to VU and its rare hybrid with *Asplenium trichomanes* subsp. *trichomanes*, i.e. *Asplenium* ×*alternifolium* was now assessed as EN. The three fern taxa found exclusively in a single location or exhibiting severe fragmentation (Krippel & Wolff 2025) were classified as CR in the present Red List: *Asplenium* ×*murbeckii* (previously listed as R in the 2005 Red List), *Osmunda regalis*, and *Thelypteris palustris* (both of which were already classified as CR in the 2005 Red List). The six species and two hybrids of horsetails were all assessed as LC (respectively DD for *Equisetum* ×*moorei*), except for *Equisetum telmateia* assessed as NT due to recent decreases in population sizes (Krippel 2023). In contrast, the conservation status of the lycophytes in Luxembourg is alarming: four out of six species are considered to be RE and *Lycopodium annotinum* (R in the 2005 Red List) and *L. clavatum* (only some square-decimeters left) are CR. Lycophytes are known to be weak competitors and their strong decline in Luxembourg goes hand in hand with the loss of nutrient poor habitats, such as heathlands and forest fens (Krippel & Massard 2019).

3.7 Comments on apomictic taxa groups

The present checklist includes 95 apomictic micro-species in the genera *Taraxacum* and *Rubus*. In Luxembourg, the distribution of *Rubus* L. subg. *Rubus* was studied in the beginning of the 1990s with a systematic inventory on a raster basis, providing a sound overview of the occurring species and their distribution (Helminger 1992; Colling, Helminger & Reichling 1994; Helminger 2009). Only few fortuitous observations have been added since then (MnhnL 2000-). The 72 *Rubus*-species documented by herbarium specimens (Helminger 2009) have been integrated into the present checklist, with a number of taxonomic corrections (Verloove & Van Rossum 2024). In the Atlas Florae Europaeae volume on the genus

Rubus (Kurtto et al. 2010) 27 additional species were listed as also occurring in Luxembourg. However, for none of these species recently confirmed occurrences exist in the Global Biodiversity Information Facility (GBIF.org 2023) nor in the national biodiversity database (MnhnL 2000-) so these taxa were not included in the present Red List. Three of the additional species, *R. fasciculatiformis*, *R. gratus* and *R. phyllostachys* have wider distribution ranges that extend up to the Luxembourgish border and may well be present in the country but overlooked. The other taxa are either regional species from the Netherlands and the north of Belgium, with often only very few documented occurrences, or species with medium distribution ranges at a large geographical distance from Luxembourg (e.g. United Kingdom or central to western France) (GBIF.org 2023).

Taxonomically complex apomictic micro-species groups like *Rubus*, *Taraxacum*, *Hieracium*, *Pilosella, Alchemilla*, *Sorbus* or *Ranunculus auricomus* constitute an important part of the biodiversity of the local flora (Gregor & Matzke-Hajek 2002). However, they are often not determined to the micro-species level and only recorded as species groups or aggregates. These groups can include common and widespread taxa as well as taxa with smaller, regional or local ranges that may be threatened. Well-delimited taxa treated as species should not be left out of conservation efforts aiming to preserve genetic diversity just because they are ubiquitous as a micro-species group with a few dominant species, or because their determination is difficult or including them would increase the number of threatened species in Red Lists (Gregor & Matzke-Hajek 2002). The species composition within apomictic groups can show substantial variation among adjacent regions and seems to be most diverse in traditional agricultural landscapes (Haveman & Ronde 2013; Haveman et al. 2016). Because of their limited range extent of 50-500 km or less, many of the regionally occurring apomictic species are more or less endemic to particular regions or countries. For these reasons many *Rubus* species are considered to be taxa of particular responsibility for conservation (Ludwig et al. 2007). However, in many cases there has been no continuous monitoring of these taxa, which makes it difficult to evaluate their threat status.

4 Discussion

4.1 Methodology

In contrast to the method used in the 2005 Red List we relied on the *R* package *ConR* for a provisional assessment of plant taxa in the present version of the Red List. A preliminary study on a subset of taxa indicated that this procedure allowed us to evaluate the threat status of the native plant taxa of Luxembourg with similar results to the methodology used in 2005 and confirmed that the differences among the two versions of the Red Lists were not mainly due to the methodological change. In a case study on African palm species the comparison between the full IUCN assessment and the automated one with *ConR* was also generally congruent with 71 % of the taxa assigned to the same threat category in both cases (Dauby et al. 2017). A similar case study on Madagascar palm species even found an 81 % consistency between both types of assessment methods (Nic Lughadha et al. 2019). In a study comparing an automated conservation assessment of a large dataset on Orchid species to a full IUCN assessment it was found that automated methods can identify possibly threatened species with an accuracy of up to 85 % when deep learning algorithms were used (Zizka et al. 2021). In our case, 10.7 % of the automated provisional assignments by ConR were revised based on additional criteria during the final assessment. Our findings confirm that using automated methods for provisional assessments can significantly reduce the time required and may facilitate more frequent updates to Red Lists.

4.2 Comparison between the 2005 Red List and the present Red List

Between 2005 and 2025, the number and proportion of threatened plant taxa strongly increased. The increase in the number of taxa in nearly all threat categories clearly indicates that neither legal protection (Mémorial 2010) nor conservation measures applied until now stopped the erosion of native plant taxa in Luxembourg. This is also clearly indicated by the fact that the

number of RE taxa has increased since 2005. Moreover, the proportion of NT taxa increased strongly in comparison to the 2005 Red List (from 3.2 % to 9.9 %).

It has been shown that Luxembourg and the Saarland face higher local extinction rates of plant taxa in comparison to larger countries or regions (Colling 2005; Schneider et al. 2020). One likely explanation is the much smaller total population sizes of threatened plant taxa in small countries or regions (Colling 2005). Plant taxa with small population sizes are known to have a higher risk of extinction (Matthies et al. 2004; Frankham et al. 2017). The higher extinction rates observed in Luxembourg and the Saarland highlight the importance of considering differences in the size of study areas when comparing threat levels across countries or regions (see Colling 2005). An alternative explanation for the higher local extinction rates could be that smaller regions are less efficient in conserving their plant biodiversity. Due to their small size, conservation areas in these regions are often also very small and can harbour only small local populations of endangered plant taxa. Moreover, inappropriate management of threatened habitats can quickly lead to the extinction of threatened plant species (Colling & Matthies 2006). Another line of evidence for high threat levels in small regions is that the RLI-value for vascular plants in Luxembourg was much lower (higher extinction risk) than the baseline value for plants of 0.86 calculated on a worldwide randomly selected sample of plant taxa (Brummitt et al. 2015).

Changes in threat category at the species level between the two versions of the Red List are due to either genuine or non-genuine changes (IUCN Standards and Petitions Committee 2024). A genuine change corresponds to a real status change that has taken place since the last assessment. Examples of this kind were the downgrades in threat category of *Anacamptis pyramidalis* (VU -> LC), *Ophrys apifera* (EN -> VU) and *Himantoglossum hircinum* (EN -> LC) due to their increases in population sizes and the area of occupancy probably as a consequence of climate change. However, changes in the threat category might also be due to non-genuine changes like a change in methodology in threat assessment, taxonomy, new information or observation biases related to the recorders. The differences may also result from spatial-temporal biases in the opportunistic data used, underscoring the need for caution when interpreting changes in threat categories at the species level. To analyse trends in extinction risk over time, occupancy models could be employed, even in datasets with a large part of opportunistic data such as those in the museum's Recorder 6 database (van Strien, van Swaay & Termaat 2013).

4.3 Differences among habitats

Ruderal communities (RUD), dry and mesophile grasslands and heathlands (DRY), marshes and wet grasslands (MAR), woodlands, forest edges and cuttings (FOR) harbour nearly 80 % of the plant diversity in Luxembourg. Since these habitat types with the highest species diversities also harbour the highest number of threatened species, they should be prioritised in conservation actions (Colling et al. 2022; Schneider et al. 2024a). DRY, MAR, RUD, and FOR habitats also had the highest numbers of RE plant species and DRY and RUD habitats had the highest numbers of CR taxa. The number of RE taxa increased in DRY, MAR and FOR in comparison to the 2005 Red List. An alarming proportion of more than 40 % of all taxa in DRY, FRE and AQU habitats were considered to be threatened, indicating that the applied conservation measures in these habitats could not stop the decrease of plant biodiversity in Luxembourg over the last two decades. Known causes that may negatively affect the survival of populations of threatened plant species in these habitats are ongoing habitat fragmentation and changes in land use (Leimu et al. 2006; Ouborg et al. 2006; Klimek, Hofmann & Isselstein 2007; Härdtle 2024).

ROC habitats had low proportions and numbers of RE and CR taxa indicating that these habitats were less subject to recent fragmentation and changes in land use. Threatened species in ROC habitats are often considered to be old rare species because their habitats are naturally fragmented and populations have been isolated for a long time (see Putz, Schmid & Reisch 2015; Walisch et al. 2015). Typical examples are ice age relics like *Saxifraga rosacea* subsp. *sponhemica* and *Dianthus gratianopolitanus*.

4.4 Biotic homogenization and Established Aliens in different habitat types

A higher increase in the number of Established Aliens (EA) (from 118 to 172) compared to the increase of RE plant taxa (from 88 to 104) took place between 2005 and 2025. These results suggest that losses in native species richness in Luxembourg are more than compensated by range-expanding species in contrast to "no-net-change" publications (Bühler & Roth 2011; Vellend et al. 2013; Vellend 2017). The increase of EA and the loss of native taxa indicate that the flora of Luxembourg is becoming increasingly dominated by ubiquist alien taxa. This change in species composition contributes to an increasing biotic homogenization of the worldwide flora (McKinney & Lockwood 2001; Newbold et al. 2018).

The number of EA plant taxa differed strongly among habitat types. RUD habitats had the highest proportions of EA. Newly discovered taxa in ruderal habitats had a much higher probability to be an EA species than taxa in other habitats indicating that RUD habitats are very favourable to the establishment of new alien taxa (Chytrý et al. 2008; Newbold et al. 2018). In contrast, the proportion of EA was very low in DRY, MAR and GRA habitats suggesting that these habitats are highly resistant to the establishment of EA taxa (Chytrý et al. 2008). The probability that recently established plant species in a specific habitat are EA could thus be considered as a proxy for the invasibility of that habitat. Competition by EA may potentially increase the extinction risk of native plant species (McKinney & Lockwood 2001; Ries et al. 2013; Ries, Krippel & Pfeiffenschneider 2020). However, some habitats like DRY and MAR showed a high number of threatened plant species and a very low number of EA suggesting that in these habitats other factors like habitat fragmentation and changes in land use could be important factors in the decline and extinction of threatened taxa. In contrast, the very low number of threatened and EA plant species in intensively managed grasslands (GRA) indicates that this regime favours only a few very competitive grass species. The intense management regime with frequent cuttings and high levels of artificial nutrient input may prevent the establishment of endangered native taxa (Colling & Matthies 2006; Ceulemans et al. 2013) and of alien species.

4.5 International responsibilities

Although Luxembourg does not host any endemic species, certain plant populations in the country hold international significance and require targeted conservation efforts. For example, *Saxifraga rosacea* subsp. *sponhemica* has a significant portion of its global population located in Luxembourg (Colling 2005; Walisch et al. 2015). Another taxon of particular relevance is *Dactylorhiza incarnata* subsp. *cungsii* only known from one population in southern Luxembourg, although its taxonomic status has recently been questioned (Verloove 2023). Other plant taxa like *Hymenophyllum tunbrigense*, *Vandenboschia speciosa* and *Rorippa stylosa* have isolated populations (see Colling 2005) for which Luxembourg has an international conservation responsibility as they occur far from their main distribution area so that their conservation is of special biogeographical interest. For *Anemone pulsatilla* which is listed as Near Threatened on the global IUCN Red List of threatened species (Schweizer & Hasinger 2014), Luxembourg has an international conservation responsibility as well. In addition to these examples, we identified 40 Central European vascular plant taxa occurring in Luxembourg listed in Schnittler & Günther (1999) as requiring priority conservation measures (Tab. 6).

Out of the 40 Central European taxa listed for Luxembourg, 15 taxa are considered to be Regionally Extinct (RE), six are Critically Endangered (CR), twelve are Endangered (EN), four are Vulnerable (VU), one is Near Threatened (NT), and two are Least Concern (LC) (Tab. 6). The 25 extant taxa all require species action plans to ensure their long-term conservation. At present such plans exist only for three taxa: *Saxifraga rosacea* subsp. *sponhemica*, *Gentianella germanica* and *Anemone pulsatilla*. For the 15 RE taxa, translocation measures would be necessary to reintroduce the species (Schneider et al. 2024a).

4.6 Plant conservation actions

To stop the continuing decline of threatened plant species in Luxembourg and prevent further local extinctions requires consistent conservation actions. The CR taxa of the present Red List and the plant taxa for which Luxembourg has a particular

Tab. 6: Central European vascular plant taxa occurring in Luxembourg requiring priority conservation measures.
! responsibility, !! high responsibility, !!! particular responsibility, (!!!) responsible for isolated outposts (for details see Schnittler & Günther 1999).

Taxon	Responsibility	Threat category
Anacamptis coriophora	!	RE
Anacamptis pyramidalis	!	LC
Anemone pulsatilla	!	EN
Arnoseris minima	!!	RE
Bromus racemosus	!!	LC
Carex davalliana	!!!	RE
Carex diandra	!	RE
Carex pulicaris	!!	CR
Carex strigosa	!	RE
Crepis praemorsa	!	CR
Cuscuta epilinum	!!	RE
Dactylorhiza incarnata	!!	EN
Dactylorhiza incarnata subsp. *cungsii*	!!!	CR
Dactylorhiza majalis	!!	NT
Dianthus gratianopolitanus	!!!	CR
Drymocallis rupestris	!!!	EN
Dryopteris cristata	!	RE
Epipactis muelleri	!!	EN
Epipactis palustris	!	EN
Epipogium aphyllum	!!	CR
Galium tricornutum	!	RE
Gentianella germanica	!!	EN
Herminium monorchis	!	RE
Hymenophyllum tunbrigense	(!!!)	EN
Juncus capitatus	!!	RE
Lolium remotum	!!	RE
Lycopodium tristachyum	!	RE
Lythrum hyssopifolia	!	VU
Nymphoides peltata	!	EN
Oenanthe fistulosa	!!	VU
Orobanche elatior	!!	RE
Pedicularis sylvatica	!	EN
Phelipanche purpurea	!	VU
Phelipanche ramosa	!	RE
Potamogeton trichoides	!!	EN
Ranunculus lingua	!	VU
Saxifraga rosacea subsp. *sponhemica*	!!	EN
Scandix pecten-veneris	!	RE
Sesleria caerulea	!!	EN
Thesium pyrenaicum	!	CR

international responsibility (Tab. 6), constitute together the first proposal for a list of national priority species that need specific conservation actions. Conservation actions should include ex situ and in situ measures like translocations, suitable habitat management regimes (e.g. voluntary contract-based conservation measures) or the strict legal protection of sites (Schneider 2019).

The ex situ propagation of threatened plant species and the production of autochthonous seeds are increasingly important for plant conservation efforts (Schneider et al. 2024b) as translocations are an essential method to strengthen declining populations of threatened species (Godefroid et al. 2011; Breit et al. 2023). Over the last 20 years, translocations have been implemented for nearly 100 EN, CR and LC plant species in Luxembourg (Schneider et al. 2024a). A translocation is considered to be successful when the reinforced or (re)introduced populations show natural establishment of juvenile plants. For successful conservation, translocations often need to be repeated over a long time period and large spatial scales, especially for Critically Endangered species (Diekmann et al. 2015; Schneider et al. 2024a). Sound habitat management based on scientific evidence and long-term monitoring of population sizes and population structure are also important. The general objectives and recommendations for practical implementation of conservation measures are outlined in the Plant Conservation Strategy for Luxembourg (Colling et al. 2022).

In addition to the conservation of targeted species, the restoration of entire ecosystems is of the utmost importance (MECDD 2023; European Parliament 2024). The transfer of diaspores via green hay can be used to restore entire species assemblages of species-rich grasslands (Biro et al. 2024; Schneider & Breit 2024) whereas the creation of conservation crop fields is recommended for the preservation of communities of increasingly rare arable species (Bergmeier et al. 2022). To allow early interventions and prevent further declines of threatened plant species, regular monitoring of their populations and their habitats is essential (Hollenbach et al. 2014; Härdtle 2024). Future biodiversity conservation actions and landscape planning should not neglect conservation actions

for plant species as outlined in the National Conservation Plan and the Plant Conservation Strategy (Colling et al. 2022; MECDD 2023). The extinction of any plant species threatens the integrity of intact ecosystems and, consequently, the ecosystem services they provide (Härdtle 2024).

5 Red List of the vascular plants of Luxembourg

5.1 Legend

Taxon name

According to Verloove and Van Rossum (2024).

Threat category

RE	Regionally Extinct
CR	Critically Endangered
EN	Endangered
VU	Vulnerable
NT	Near Threatened
LC	Least Concern
DD	Data Deficient
NA	Not Applicable

Status

N	Native
EA	Established Alien

Criteria sub-heads

A	Population size reduction
B	Geographic range size
C	Small population size and decline
D	Very small or restricted population
E	Quantitative analysis of extinction risk

For a complete description of the criteria see Appendix 1 and IUCN Standards and Petitions Committee (2024).

Habitat types

AQU	Aquatic habitats and springs
DRY	Dry and mesophile grasslands and heathlands
FOR	Woodlands, forest edges and cuttings
FRE	Freshwater margins and damp mud
GRA	Intensively managed grasslands
MAR	Marshes, swamps and wet grasslands
ROC	Rocks and screes
RUD	Fallow land, ruderal communities and arable fields

The Red List is avaible for download at https://www.mnhn.lu/ferrantia/ in table format.

5.2 Threat categories of the vascular plant taxa of Luxembourg

Taxon	Threat category	Status	Criteria sub-heads	Habitat type
Acer campestre L.	LC	N		FOR
Acer negundo L.	NA	EA		FOR
Acer platanoides L.	LC	N		FOR
Acer pseudoplatanus L.	LC	N		FOR
Achillea millefolium L.	LC	N		DRY
Achillea nobilis L.	NA	EA		DRY
Achillea ptarmica L.	LC	N		MAR
Aconitum lycoctonum L.	EN	N	B2ab(i,iv)	FOR
Acorus calamus L.	NA	EA		FRE
Actaea spicata L.	VU	N	B2ab(i,iv)	FOR
Adonis aestivalis L.	RE	N		RUD
Adonis annua L.	RE	EA		RUD
Adonis flammea Jacq.	RE	N		RUD
Adoxa moschatellina L.	LC	N		FOR
Aegopodium podagraria L.	LC	N		FOR
Aethusa cynapium L.	LC	N		RUD
Agrimonia eupatoria L.	LC	N		DRY
Agrimonia procera Wallr.	NT	N		FOR
Agrostemma githago L.	RE	N		RUD
Agrostis canina L.	LC	N		MAR
Agrostis capillaris L.	LC	N		DRY
Agrostis gigantea Roth	EN	N	B2ab(i,iv)	RUD
Agrostis stolonifera L.	LC	N		MAR
Agrostis vinealis Schreb.	RE	N		DRY
Ailanthus altissima (Mill.) Swingle	NA	EA		RUD
Aira caryophyllea L.	VU	N	B2ab(i,iv)	DRY
Aira praecox L.	VU	N	B2ab(i,iv)	DRY
Ajuga chamaepitys (L.) Schreb.	RE	N		RUD
Ajuga genevensis L.	VU	N	A2c+B2ab(i,iv)	DRY
Ajuga pyramidalis L.	VU	N	A2c+B2ab(iii,v)c(iv)	DRY
Ajuga reptans L.	LC	N		MAR
Alchemilla acutiloba Opiz	NT	N		DRY
Alchemilla filicaulis Buser	VU	N	B2ab(i,iv)	DRY
Alchemilla glabra Neygenf.	LC	N		MAR
Alchemilla monticola Opiz	VU	N	B2ab(i,iv)	DRY
Alchemilla xanthochlora Rothm.	NT	N		DRY
Alisma lanceolatum With.	VU	N	B2ab(i,iv)	AQU
Alisma plantago-aquatica L.	LC	N		FRE
Alliaria petiolata (Bieb.) Cavara et Grande	LC	N		FOR
Allium oleraceum L.	LC	N		DRY
Allium rotundum L.	RE	N		RUD
Allium scorodoprasum L.	NA	EA		DRY
Allium ursinum L.	LC	N		FOR
Allium vineale L.	LC	N		DRY
Alnus glutinosa (L.) Gaertn.	LC	N		MAR

Taxon	Threat category	Status	Criteria sub-heads	Habitat type
Alnus incana (L.) Moench	NA	EA		RUD
Alopecurus aequalis Sobol.	EN	N	B2ab(i,iv)+B2b(i,iv)	MAR
Alopecurus geniculatus L.	LC	N		MAR
Alopecurus myosuroides Huds.	LC	N		RUD
Alopecurus pratensis L.	LC	N		GRA
Alopecurus rendlei Eig	VU	N	A2c+B2ab(i,iv)	MAR
Althaea officinalis L.	EN	N	B2ab(i,iv)	MAR
Alyssum alyssoides (L.) L.	VU	N	B2ab(i,iv)	ROC
Amaranthus retroflexus L.	NA	EA		RUD
Ambrosia artemisiifolia L.	NA	EA		RUD
Amelanchier lamarckii F.G. Schroeder	NA	EA		FOR
Amelanchier ovalis subsp. *embergeri* Favarger et Stearn	EN	N	B2ab(i,iv)	ROC
Anacamptis coriophora (L.) R.M. Bateman, Pridgeon et M.W. Chase	RE	N		MAR
Anacamptis morio (L.) R.M. Bateman, Pridgeon et M.W. Chase	CR	N	A2c+B2ab(i,iv)+C2a(i)	DRY
Anacamptis pyramidalis (L.) L.C.M. Rich.	LC	N		DRY
Anemone nemorosa L.	LC	N		FOR
Anemone pulsatilla L.	EN	N	A2c+B2ab(i,iv)	DRY
Anemone ranunculoides L.	VU	N	B2ab(i,iv)	FOR
Anemone sylvestris L.	RE	N		FOR
Angelica sylvestris L.	LC	N		MAR
Anisantha sterilis (L.) Nevski	LC	N		RUD
Anisantha tectorum (L.) Nevski	NT	N		RUD
Antennaria dioica (L.) Gaertn.	RE	N		FOR
Anthemis arvensis L.	VU	N	A2c+B2ab(i,iv)	RUD
Anthemis cotula L.	EN	N	B2ab(i,iv)	RUD
Anthericum liliago L.	VU	N	B2ab(i,iv)	ROC
Anthoxanthum aristatum Boiss.	RE	EA		RUD
Anthoxanthum odoratum L.	LC	N		GRA
Anthriscus caucalis Bieb.	NA	EA		RUD
Anthriscus sylvestris (L.) Hoffmann	LC	N		GRA
Anthyllis vulneraria L.	NT	N		DRY
Apera interrupta (L.) Beauv.	NA	EA		RUD
Apera spica-venti (L.) Beauv.	LC	N		RUD
Aphanes arvensis L.	LC	N		RUD
Aphanes australis Rydb.	VU	N	B2ab(i,iv)	RUD
Aquilegia vulgaris L.	NT	N		FOR
Arabidopsis arenosa (L.) Lawalrée	LC	N		ROC
Arabidopsis thaliana (L.) Heynh.	LC	N		RUD
Arabis hirsuta (L.) Scop.	VU	N	B2ab(i,iv)	DRY
Arctium lappa L.	LC	N		RUD
Arctium minus (Hill) Bernh.	VU	N	B2ab(i,iv)	RUD
Arctium nemorosum Lej.	DD	N		FOR
Arctium tomentosum Mill.	EN	N	B2ab(i,iv)	RUD
Arenaria leptoclados (Reichenb.) Guss.	DD	N		DRY
Arenaria serpyllifolia L.	LC	N		ROC
Argentina anserina (L.) Rydb.	LC	N		RUD
Aristolochia clematitis L.	EN	N	B2ab(i,iv)	FOR

Taxon	Threat category	Status	Criteria sub-heads	Habitat type
Arnica montana L.	VU	N	B2ab(i,iv)	DRY
Arnoseris minima (L.) Schweigg. et Körte	RE	N		RUD
Arrhenatherum elatius (L.) Beauv. ex J. et C. Presl	LC	N		GRA
Artemisia absinthium L.	VU	N	B2ab(i,iv)	RUD
Artemisia vulgaris L.	LC	N		RUD
Arum maculatum L.	LC	N		FOR
Asarum europaeum L.	CR	N	B2ab(i,iv)	FOR
Asperula cynanchica L.	VU	N	B2ab(i,iv)	DRY
Asplenium adiantum-nigrum L.	LC	N		ROC
Asplenium ×alternifolium Wulfen	EN	N	B2ab(i,iv)	ROC
Asplenium ceterach L.	VU	N	B2ab(i,iv)	ROC
Asplenium fontanum (L.) Bernh.	RE	N		ROC
Asplenium ×murbeckii Dörfler	CR	N	B2ab(i,iv)+D	ROC
Asplenium obovatum subsp. *billotii* (F.W. Schultz) O. Bolòs, Vigo, Masalles et Ninot	RE	N		ROC
Asplenium ruta-muraria L.	LC	N		ROC
Asplenium scolopendrium L.	LC	N		ROC
Asplenium septentrionale (L.) Hoffmann	VU	N	B2ab(iii,iv)	ROC
Asplenium trichomanes L.	LC	N		ROC
Asplenium trichomanes L. subsp. *trichomanes*	LC	N		ROC
Asplenium trichomanes nsubsp. *staufferi* Lovis et Reichst.	VU	N	B2ab(i,iv)	ROC
Asplenium trichomanes subsp. *pachyrachis* (Christ) Lovis et Reichst.	LC	N		ROC
Asplenium trichomanes subsp. *quadrivalens* D.E. Mey.	LC	N		ROC
Asplenium viride Huds.	RE	N		ROC
Aster amellus L.	EN	N	B2ab(i,iv)	DRY
Astragalus glycyphyllos L.	LC	N		FOR
Athyrium filix-femina (L.) Roth	LC	N		FOR
Atocion armeria (L.) Rafin.	CR	N	B2ab(i,iv)	DRY
Atriplex micrantha Ledeb.	NA	EA		RUD
Atriplex patula L.	VU	N	B2ab(i,iv)	RUD
Atriplex prostrata Boucher ex DC.	VU	N	B2ab(i,iv)	RUD
Atropa bella-donna L.	LC	N		FOR
Avena fatua L.	LC	N		RUD
Avenella flexuosa (L.) Drejer	LC	N		FOR
Avenula pubescens (Huds.) Dum.	NT	N		DRY
Azolla filiculoides Lam.	NA	EA		AQU
Ballota nigra L.	EN	N	B2ab(i,iv)	RUD
Barbarea intermedia Boreau	LC	N		RUD
Barbarea vulgaris R. Brown	LC	N		RUD
Bellis perennis L.	LC	N		GRA
Berberis aquifolium Pursh	NA	EA		FOR
Berberis vulgaris L.	EN	N	B2ab(i,iv)	FOR
Berteroa incana (L.) DC.	NA	EA		RUD
Berula erecta (Huds.) Coville	NT	N		FRE
Betonica officinalis L.	NT	N		DRY
Betula pendula Roth	LC	N		FOR
Betula pubescens Ehrh.	VU	N	B2ab(i,iv)	FOR

Taxon	Threat category	Status	Criteria sub-heads	Habitat type
Bidens cernua L.	LC	N		FRE
Bidens frondosa L.	NA	EA		FRE
Bidens tripartita L.	LC	N		FRE
Bistorta officinalis Delarbre	LC	N		MAR
Blackstonia perfoliata (L.) Huds.	RE	N		DRY
Blechnum spicant (L.) Roth	VU	N	B2ab(iii)	FOR
Blitum bonus-henricus (L.) C.A. Mey.	EN	N	B2ab(i,iv)	RUD
Blysmus compressus (L.) Panzer ex Link	RE	N		MAR
Bolboschoenus laticarpus Marhold, Hroudová, Duchácek & Zákr.	CR	N	B2ab(i,iv)+D	FRE
Botrychium lunaria (L.) Swartz	EN	N	B2ab(i,iv)	DRY
Brachypodium pinnatum (L.) Beauv.	LC	N		DRY
Brachypodium sylvaticum (Huds.) Beauv.	LC	N		FOR
Brassica nigra (L.) Koch	EN	N	B2ab(i,iv)	RUD
Briza media L.	LC	N		DRY
Bromopsis benekenii (Lange) Holub	DD	N		FOR
Bromopsis erecta (Huds.) Fourr.	LC	N		DRY
Bromopsis inermis (Leyss.) Holub	VU	N	B2ab(i,iv)	RUD
Bromopsis ramosa (Huds.) Holub	NT	N		FOR
Bromus arvensis L.	VU	N	B2ab(i,iv)	RUD
Bromus commutatus Schrad.	LC	N		RUD
Bromus hordeaceus L.	LC	N		GRA
Bromus racemosus L.	LC	N		MAR
Bromus secalinus L.	LC	N		RUD
Bryonia dioica Jacq.	NT	N		FOR
Buddleja davidii Franch.	NA	EA		RUD
Buglossoides arvensis (L.) I.M. Johnst.	EN	N	B2ab(i,iv)	RUD
Buglossoides purpurocaerulea (L.) I.M. Johnst.	VU	N	B2ab(i,iv)	FOR
Bunias orientalis L.	NA	EA		RUD
Bunium bulbocastanum L.	VU	N	C2a(i)	RUD
Bupleurum falcatum L.	LC	N		DRY
Bupleurum rotundifolium L.	NA	EA		RUD
Butomus umbellatus L.	EN	N	B2ab(i,iv)	AQU
Buxus sempervirens L.	EN	N	B2ab(i,iv)	FOR
Calamagrostis arundinacea (L.) Roth	CR	N	B2ab(i,iv)	FOR
Calamagrostis canescens (Weber) Roth	EN	N	B2ab(i,iv)	FOR
Calamagrostis epigejos (L.) Roth	LC	N		FOR
Calamintha nepeta subsp. *sylvaticum* (Bromf.) Peruzzi et F. Conti	EN	N	B2ab(i,iv)	FOR
Calendula arvensis L.	EN	N	B2ab(i,iv)	RUD
Calepina irregularis (Asso) Thell.	NA	EA		RUD
Calla palustris L.	RE	N		MAR
Callitriche hamulata Kütz. ex Koch	LC	N		AQU
Callitriche obtusangula Le Gall	CR	N	B2ab(i,iv)	AQU
Callitriche palustris L.	DD	N		AQU
Callitriche platycarpa Kütz.	LC	N		AQU
Callitriche stagnalis Scop.	LC	N		AQU
Calluna vulgaris (L.) Hull	LC	N		DRY
Caltha palustris L.	NT	N		MAR

Taxon	Threat category	Status	Criteria sub-heads	Habitat type
Campanula cervicaria L.	RE	N		FOR
Campanula glomerata L.	VU	N	B2ab(i,iv) C1+C2a(i)	DRY
Campanula patula L.	EN	N	B2ab(i,iv)	DRY
Campanula persicifolia L.	LC	N		FOR
Campanula rapunculoides L.	LC	N		RUD
Campanula rapunculus L.	LC	N		DRY
Campanula rotundifolia L.	LC	N		DRY
Campanula trachelium L.	LC	N		FOR
Capsella bursa-pastoris (L.) Med.	LC	N		RUD
Cardamine amara L.	LC	N		MAR
Cardamine bulbifera (L.) Crantz	EN	N	B2ab(i,iv)	FOR
Cardamine flexuosa With.	LC	N		FOR
Cardamine hirsuta L.	LC	N		RUD
Cardamine impatiens L.	NT	N		FOR
Cardamine pratensis L.	LC	N		GRA
Carduus crispus L.	LC	N		RUD
Carduus nutans L.	LC	N		RUD
Carex acuta L.	LC	N		MAR
Carex acutiformis Ehrh.	LC	N		MAR
Carex brizoides L.	EN	N	B2ab(i,iv)	FOR
Carex canescens L.	VU	N	A2c+B2ab(i,iv)	MAR
Carex caryophyllea Latourr.	LC	N		DRY
Carex davalliana Smith	RE	N		MAR
Carex demissa Hornem.	LC	N		MAR
Carex depauperata Curt. ex With.	RE	N		FOR
Carex diandra Schrank	RE	N		MAR
Carex digitata L.	VU	N	B2ab(i,iv)	FOR
Carex distans L.	VU	N	B2ab(i,iv)	MAR
Carex disticha Huds.	LC	N		MAR
Carex divulsa Stokes	DD	N		FOR
Carex echinata Murray	NT	N		MAR
Carex elata All.	VU	N	B2ab(i,iv)	MAR
Carex elongata L.	EN	N	A2c+B2ab(i,iv)	FOR
Carex flacca Schreb.	LC	N		DRY
Carex flava L.	EN	N	B2ab(i,iv)	MAR
Carex hirta L.	LC	N		GRA
Carex hostiana DC.	CR	N	B2ab(i,iv)+C2a(i)	MAR
Carex humilis Leyss.	RE	N		ROC
Carex leersii F.W. Schultz	DD	N		FOR
Carex lepidocarpa Tausch	EN	N	A2c+B2ab(i,iv)	MAR
Carex leporina L.	LC	N		MAR
Carex montana L.	EN	N	B2ab(i,iv)	FOR
Carex muricata L.	DD	N		FOR
Carex nigra (L.) Reichard	LC	N		MAR
Carex ornithopoda Willd.	CR	N	B2ab(i,iv)	FOR
Carex otrubae Podp.	NT	N		MAR
Carex pairae F.W. Schultz	DD	N		FOR

Taxon	Threat category	Status	Criteria sub-heads	Habitat type
Carex pallescens L.	LC	N		FOR
Carex panicea L.	LC	N		MAR
Carex paniculata L.	LC	N		MAR
Carex pendula Huds.	LC	N		FOR
Carex pilosa Scop.	EN	N	B2ab(i,iv)	FOR
Carex pilulifera L.	LC	N		FOR
Carex pseudocyperus L.	VU	N	B2ab(i,iv)	FRE
Carex pulicaris L.	CR	N	B2ab(i,iv)+C2a(i)	MAR
Carex remota Jusl. ex L.	LC	N		FOR
Carex riparia Curt.	LC	N		MAR
Carex rostrata Stokes	NT	N		MAR
Carex spicata Huds.	LC	N		DRY
Carex strigosa Huds.	RE	N		FOR
Carex sylvatica Huds.	LC	N		FOR
Carex tomentosa L.	NT	N		DRY
Carex umbrosa Host	CR	N	B2ab(i,iv)	FOR
Carex vesicaria L.	LC	N		MAR
Carex vulpina L.	LC	N		MAR
Carlina vulgaris L.	LC	N		DRY
Carpinus betulus L.	LC	N		FOR
Carum carvi L.	LC	N		DRY
Castanea sativa Mill.	NA	EA		FOR
Catabrosa aquatica (L.) Beauv.	EN	N	B2ab(i,iv)	FRE
Catapodium rigidum (L.) C.E. Hubbard	NA	EA		RUD
Caucalis platycarpos L.	RE	N		RUD
Centaurea calcitrapa L.	RE	N		RUD
Centaurea decipiens Thuill.	DD	N		DRY
Centaurea jacea L.	LC	N		DRY
Centaurea nigra L.	LC	N		DRY
Centaurea scabiosa L.	LC	N		DRY
Centaurium erythraea Rafn	NT	N		DRY
Centaurium pulchellum (Swartz) Druce	EN	N	B2ab(i,iv)	FRE
Centranthus ruber (L.) DC.	NA	EA		ROC
Cephalanthera damasonium (Mill.) Druce	LC	N		FOR
Cephalanthera longifolia (L.) Fritsch	VU	N	A2c+B2ab(i,iv)	FOR
Cephalanthera rubra (L.) L.C.M. Rich.	EN	N	B2ab(i,iv)	FOR
Cerastium arvense L.	LC	N		DRY
Cerastium brachypetalum Desp. ex Pers.	LC	N		ROC
Cerastium fontanum subsp. *vulgare* (Hartm.) Greuter et Burdet	LC	N		GRA
Cerastium glomeratum Thuill.	LC	N		RUD
Cerastium pumilum Curt.	LC	N		DRY
Cerastium semidecandrum L.	LC	N		DRY
Cerastium tomentosum L.	NA	EA		ROC
Ceratophyllum demersum L.	VU	N	C2a(i)	AQU
Ceratophyllum submersum L.	CR	N	B2ab(i,iv)	AQU
Cervaria rivini Gaertn.	VU	N	B2ab(i,iv)	FOR
Chaenorhinum minus (L.) Lange	LC	N		RUD

Taxon	Threat category	Status	Criteria sub-heads	Habitat type
Chaerophyllum aureum L.	NA	EA		FOR
Chaerophyllum bulbosum L.	EN	N	B2ab(i,iv)	FRE
Chaerophyllum temulum L.	LC	N		FOR
Chelidonium majus L.	LC	N		RUD
Chenopodiastrum hybridum (L.) S. Fuentes, Uotila et Borsch	EN	N	B2ab(i,iv)	RUD
Chenopodiastrum murale (L.) S. Fuentes, Uotila et Borsch	RE	N		RUD
Chenopodium album L.	LC	N		RUD
Chenopodium vulvaria L.	RE	N		RUD
Chondrilla juncea L.	CR	N	B2ab(i,iv)	RUD
Chrysosplenium alternifolium L.	LC	N		AQU
Chrysosplenium oppositifolium L.	LC	N		AQU
Cichorium intybus L.	LC	N		RUD
Circaea alpina L.	CR	N	B2ab(i,iv)+D	FOR
Circaea ×intermedia Ehrh.	EN	N	B2ab(i,iv)	FOR
Circaea lutetiana L.	LC	N		FOR
Cirsium acaulon (L.) Scop.	NT	N		DRY
Cirsium arvense (L.) Scop.	LC	N		RUD
Cirsium eriophorum (L.) Scop.	LC	N		RUD
Cirsium oleraceum (L.) Scop.	LC	N		MAR
Cirsium palustre (L.) Scop.	LC	N		MAR
Cirsium vulgare (Savi) Ten.	LC	N		RUD
Claytonia perfoliata Donn ex Willd.	NA	EA		RUD
Clematis vitalba L.	LC	N		FOR
Clinopodium acinos (L.) O. Kuntze	VU	N	A2c+B2ab(i,iv)	DRY
Clinopodium vulgare L.	LC	N		DRY
Cochlearia danica L.	NA	EA		RUD
Coincya monensis subsp. *cheiranthos* (Vill.) Aedo, Leadlay et Muñoz Garmendia	EN	N	B2ab(i,iv)	ROC
Colchicum autumnale L.	NT	N		MAR
Colutea arborescens L.	NA	EA		FOR
Comarum palustre L.	NT	N		MAR
Conium maculatum L.	LC	N		RUD
Conopodium majus (Gouan) Loret	CR	N	B2ab(i,iv)	FOR
Convallaria majalis L.	LC	N		FOR
Convolvulus arvensis L.	LC	N		RUD
Convolvulus sepium L.	LC	N		FRE
Cornus mas L.	LC	N		FOR
Cornus sanguinea L.	LC	N		FOR
Cornus sericea L.	NA	EA		FOR
Coronilla varia L.	NT	N		RUD
Corrigiola litoralis L.	EN	N	B2ab(i,iv)	FRE
Corydalis cava (L.) Schweigg. et Körte	EN	N	B2ab(i,iv)	FOR
Corydalis solida (L.) Clairv.	LC	N		FOR
Corylus avellana L.	LC	N		FOR
Corynephorus canescens (L.) Beauv.	EN	N	B2ab(i,iv)	DRY
Cota tinctoria (L.) J. Gay	NT	N		RUD
Cotoneaster horizontalis Decaisne	NA	EA		RUD
Cotoneaster integerrimus Med.	EN	N	B2ab(i,iv)	ROC

Taxon	Threat category	Status	Criteria sub-heads	Habitat type
Crassula helmsii (T. Kirk) Cock.	NA	EA		AQU
Crataegus germanica (L.) Kuntze	NA	EA		FOR
Crataegus laevigata (Poiret) DC.	LC	N		FOR
Crataegus monogyna Jacq.	LC	N		FOR
Crataegus rosiformis Janka	EN	N	B2ab(i,iv)	FOR
Crepis biennis L.	LC	N		GRA
Crepis capillaris (L.) Wallr.	LC	N		GRA
Crepis foetida L.	EN	N	A2c+B2ab(i,iv)	RUD
Crepis paludosa (L.) Moench	LC	N		MAR
Crepis praemorsa (L.) F.W. Walther	CR	N	B2ab(i,iv)	DRY
Crepis pulchra L.	CR	N	B2ab(i,iv)	RUD
Crepis vesicaria subsp. *taraxacifolia* (Thuill.) Thell. ex Schinz et R. Keller	EN	N	B2ab(i,iv)	RUD
Cruciata laevipes Opiz	LC	N		GRA
Cryptogramma crispa (L.) R. Brown ex Hook.	RE	N		FOR
Cuscuta epilinum Weihe	RE	N		RUD
Cuscuta epithymum (L.) L.	CR	N	B2ab(i,iv)	DRY
Cuscuta europaea L.	EN	N	A2c+B2ab(i,iv)	FRE
Cuscuta lupuliformis Krocker	DD	N		FRE
Cyanus montanus (L.) Hill	LC	N		FOR
Cyanus segetum Hill	LC	N		RUD
Cymbalaria muralis P. Gaertn., B. Mey. et Scherb.	NA	EA		ROC
Cynoglossum officinale L.	EN	N	B2ab(i,iv)	RUD
Cynosurus cristatus L.	LC	N		GRA
Cyperus flavescens L.	RE	N		FRE
Cyperus fuscus L.	EN	N	B2ab(i,iv)	FRE
Cypripedium calceolus L.	RE	N		FOR
Cyrtomium fortunei J. Smith	NA	EA		RUD
Cystopteris fragilis (L.) Bernh.	LC	N		ROC
Cytisus scoparius (L.) Link	LC	N		DRY
Dactylis glomerata L. subsp. *glomerata*	LC	N		GRA
Dactylis glomerata subsp. *lobata* (Drejer) Lindb. f.	RE	N		FOR
Dactylorhiza fuchsii (Druce) Soó	VU	N	B2ab(i,iv)	MAR
Dactylorhiza incarnata (L.) Soó	EN	N	B2ab(i,iv)	MAR
Dactylorhiza incarnata subsp. *cungsii* Kreutz	CR	N	B2ab(i,iv)+D	MAR
Dactylorhiza maculata (L.) Soó	NT	N		DRY
Dactylorhiza majalis (Reichenb.) P.F. Hunt et Summerh.	NT	N		MAR
Dactylorhiza praetermissa (Druce) Soó	EN	N	B2ab(i,iv)	MAR
Dactylorhiza viridis (L.) R.M. Bateman, Pridgeon et M.W. Chase	CR	N	B2ab(i,iv)	DRY
Danthonia decumbens (L.) DC.	VU	N	C2a(i)	DRY
Daphne mezereum L.	LC	N		FOR
Datura stramonium L.	NA	EA		RUD
Daucus carota L.	LC	N		GRA
Delphinium consolida L.	CR	N	A2c+B2ab(i,iv)+C2a(i)	RUD
Deschampsia cespitosa (L.) Beauv.	LC	N		MAR
Dianthus armeria L.	NT	N		DRY
Dianthus carthusianorum L.	NT	N		DRY
Dianthus deltoides L.	VU	N	C2a(i)	DRY

Taxon	Threat category	Status	Criteria sub-heads	Habitat type
Dianthus gratianopolitanus Vill.	CR	N	B2ab(i,iv)+D	ROC
Dichoropetalum carvifolia (Vill.) Pimenov et Kljuykov	EN	N	B2ab(i,iv)	MAR
Digitalis grandiflora Mill.	VU	N	B2ab(i,iv)	FOR
Digitalis lutea L.	LC	N		FOR
Digitalis purpurea L.	LC	N		FOR
Digitaria ischaemum (Schreb.) Muhlenb.	VU	N	B2ab(i,iv)	RUD
Digitaria sanguinalis (L.) Scop.	LC	N		RUD
Dioscorea communis (L.) Caddick et Wilkin	EN	N	B2ab(i,iv)	FOR
Diplotaxis muralis (L.) DC.	RE	EA		ROC
Diplotaxis tenuifolia (L.) DC.	EN	N	B2ab(i,iv)	ROC
Dipsacus fullonum L.	LC	N		RUD
Dipsacus pilosus L.	LC	N		FOR
Draba muralis L.	LC	N		ROC
Draba verna L.	LC	N		ROC
Drosera rotundifolia L.	RE	N		MAR
Drymocallis rupestris (L.) Soják	EN	N	B2ab(i,iv)	ROC
Drymochloa sylvatica (Pollich) Holub	LC	N		FOR
Dryopteris affinis (Lowe) Fraser-Jenkins	VU	N	B2ab(i,iv)	FOR
Dryopteris affinis (Lowe) Fraser-Jenkins subsp. *affinis*	EN	N	B2ab(i,iv)	FOR
Dryopteris affinis subsp. *borreri* (Newman) Fraser-Jenkins	LC	N		FOR
Dryopteris affinis subsp. *cambrensis* Fraser-Jenkins	DD	N		FOR
Dryopteris affinis subsp. *pseudodisjuncta* (Tavel ex Fraser-Jenkins) Fraser-Jenkins	DD	N		FOR
Dryopteris carthusiana (Vill.) H.P. Fuchs	LC	N		FOR
Dryopteris ×*complexa* Fraser-Jenkins nsubsp. *complexa*	DD	N		FOR
Dryopteris ×*complexa* nsubsp. *critica* (Fraser-Jenkins) Fraser-Jenkins	DD	N		FOR
Dryopteris cristata (L.) A. Gray	RE	N		MAR
Dryopteris dilatata (Hoffmann) A. Gray	LC	N		FOR
Dryopteris filix-mas (L.) Schott	LC	N		FOR
Dysphania botrys (L.) Mosyakin et Clemants	NA	EA		RUD
Dysphania pumilio (R. Brown) Mosyakin et Clemants	NA	EA		RUD
Echinochloa crus-galli (L.) Beauv.	LC	N		RUD
Echinops sphaerocephalus L.	NA	EA		RUD
Echium vulgare L.	LC	N		RUD
Eleocharis acicularis (L.) Roem. et Schult.	CR	N	B2ab(i,iv)+D	FRE
Eleocharis ovata (Roth) Roem. et Schult.	RE	N		MAR
Eleocharis palustris (L.) Roem. et Schult.	LC	N		MAR
Eleocharis quinqueflora (F.X. Hartm.) Schwarz	CR	N	B2ab(i,iv)	MAR
Eleocharis uniglumis (Link) Schult.	VU	N	B2a+B2b(iii)	MAR
Elodea canadensis Michaux	NA	EA		AQU
Elodea nuttallii (Planch.) H. St. John	NA	EA		AQU
Elymus caninus (L.) L.	VU	N	B2ab(i,iv)	FOR
Elytrigia repens (L.) Desv. ex Nevski	LC	N		RUD
Epilobium angustifolium L.	LC	N		FOR
Epilobium brachycarpum C. Presl	NA	EA		RUD
Epilobium ciliatum Rafin.	NA	EA		RUD
Epilobium collinum C.C. Gmel.	LC	N		ROC

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Epilobium dodonaei Vill.	NA	EA		RUD
Epilobium hirsutum L.	LC	N		MAR
Epilobium lanceolatum Seb. et Mauri	NT	N		ROC
Epilobium montanum L.	LC	N		FOR
Epilobium obscurum Schreb.	LC	N		MAR
Epilobium palustre L.	NT	N		MAR
Epilobium parviflorum Schreb.	LC	N		MAR
Epilobium roseum Schreb.	VU	N	B2ab(i,iv)	RUD
Epilobium tetragonum L.	LC	N		RUD
Epimedium alpinum L.	RE	EA		FOR
Epipactis atrorubens (Hoffmann) Besser	VU	N	B2ab(i,iv)	DRY
Epipactis helleborine (L.) Crantz	LC	N		FOR
Epipactis leptochila (Godf.) Godf.	CR	N	B2ab(i,iv)	FOR
Epipactis microphylla (Ehrh.) Swartz	CR	N	B2ab(i,iv)	FOR
Epipactis muelleri Godf.	EN	N	B2ab(i,iv)	FOR
Epipactis palustris (L.) Crantz	EN	N	B2ab(i,iv)	MAR
Epipactis purpurata Smith	EN	N	B2ab(i,iv)	FOR
Epipogium aphyllum Swartz	CR	N	B2ab(i,iv)	FOR
Equisetum arvense L.	LC	N		RUD
Equisetum fluviatile L.	LC	N		MAR
Equisetum hyemale L.	LC	N		FOR
Equisetum ×litorale Kühl. ex Rupr.	LC	N		MAR
Equisetum ×moorei Newman	DD	N		FOR
Equisetum palustre L.	LC	N		MAR
Equisetum sylvaticum L.	LC	N		FOR
Equisetum telmateia Ehrh.	NT	N		FOR
Eragrostis minor Host	NA	EA		RUD
Eranthis hyemalis (L.) Salisb.	NA	EA		FOR
Erica tetralix L.	RE	N		DRY
Erigeron acris L.	LC	N		ROC
Erigeron annuus (L.) Desf.	NA	EA		RUD
Erigeron canadensis L.	NA	EA		RUD
Eriophorum angustifolium Honck.	VU	N	A2c+B2ab(i,iv)	MAR
Eriophorum latifolium Hoppe	CR	N	B2ab(i,iv)	MAR
Eriophorum vaginatum L.	RE	N		MAR
Erodium cicutarium (L.) L'Hérit.	LC	N		RUD
Ervilia hirsuta (L.) Opiz	LC	N		RUD
Ervum gracile (Loisel) DC.	VU	N	B2ab(i,iv)	RUD
Ervum tetraspermum L.	LC	N		RUD
Eryngium campestre L.	LC	N		DRY
Erysimum cheiranthoides L.	EN	N	B2ab(i,iv)	RUD
Erysimum cheiri (L.) Crantz	NA	EA		ROC
Erythranthe guttata (DC.) G.L. Nesom	NA	EA		MAR
Euonymus europaeus L.	LC	N		FOR
Eupatorium cannabinum L.	LC	N		FRE
Euphorbia amygdaloides L.	LC	N		FOR
Euphorbia cyparissias L.	LC	N		DRY

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Euphorbia dulcis subsp. *incompta* (Cesati) Nyman	EN	N	B2ab(i,iv)	FOR
Euphorbia esula L.	EN	N	B2ab(i,iv)	RUD
Euphorbia exigua L.	LC	N		RUD
Euphorbia helioscopia L.	LC	N		RUD
Euphorbia lathyris L.	NA	EA		RUD
Euphorbia maculata L.	NA	EA		RUD
Euphorbia peplus L.	LC	N		RUD
Euphorbia platyphyllos L.	LC	N		RUD
Euphorbia seguieriana Neck.	RE	N		DRY
Euphorbia stricta L.	LC	N		RUD
Euphrasia nemorosa (Pers.) Wallr.	EN	N	B2ab(i,iv)	DRY
Euphrasia officinalis subsp. *rostkoviana* (Hayne) F. Townsend	CR	N	B2ab(i,iv)	DRY
Euphrasia stricta J.P. Wolff ex Lehm.	EN	N	A2c+B2ab(i,iv)	DRY
Fagus sylvatica L.	NT	N		FOR
Falcaria vulgaris Bernh.	EN	N	B2ab(i,iv)	RUD
Fallopia convolvulus (L.) Á. Löve	LC	N		RUD
Fallopia dumetorum (L.) Holub	EN	N	B2ab(i,iv)	FOR
Festuca filiformis Pourr.	LC	N		DRY
Festuca heteropachys (St-Yves) Patzke ex Auquier	LC	N		ROC
Festuca heterophylla Lam.	DD	N		FOR
Festuca lemanii Bast.	VU	N	B2ab(i,iv)	DRY
Festuca nigrescens Lam.	DD	N		FOR
Festuca patzkei Markgr.-Dann.	CR	N	B2ab(i,iv)	DRY
Festuca rubra L.	LC	N		GRA
Ficaria verna Huds.	LC	N		FOR
Filago arvensis L.	CR	N	B2ab(i,iv)	RUD
Filago germanica L.	RE	N		RUD
Filago lutescens Jord.	RE	N		RUD
Filago pyramidata L.	RE	N		RUD
Filipendula ulmaria (L.) Maxim.	LC	N		MAR
Filipendula vulgaris Moench	CR	N	B2ab(i,iv)+C2a(i)	DRY
Foeniculum vulgare Mill.	NA	EA		RUD
Fourraea alpina (L.) Greuter et Burdet	CR	N	B2ab(i,iv)	ROC
Fragaria moschata Weston	CR	N	B2ab(i,iv)	FOR
Fragaria vesca L.	LC	N		FOR
Fragaria viridis Weston	LC	N		DRY
Frangula alnus Mill.	LC	N		FOR
Fraxinus excelsior L.	LC	N		FOR
Fumaria officinalis L.	LC	N		RUD
Fumaria parviflora Lam.	CR	N	B2ab(i,iv)+C2a(i)	RUD
Fumaria vaillantii Loisel.	EN	N	B2ab(i,iv)	RUD
Gagea lutea (L.) Ker-Gawl.	VU	N	B2ab(i,iv)	FOR
Gagea minima (L.) Ker-Gawl.	RE	N		RUD
Gagea pratensis (Pers.) Dum.	CR	N	B2ab(i,iv)	RUD
Gagea villosa (Bieb.) Sweet	CR	N	B2ab(i,iv)	RUD
Galanthus nivalis L.	NA	EA		FOR
Galega officinalis L.	NA	EA		RUD

Taxon	Threat category	Status	Criteria sub-heads	Habitat type
Galeopsis angustifolia Ehrh. ex Hoffmann	VU	N	B2ab(i,iv)	ROC
Galeopsis bifida Boenningh.	VU	N	B2ab(i,iv)	RUD
Galeopsis ladanum L.	EN	N	B2ab(i,iv)(i,iv)	ROC
Galeopsis segetum Neck.	LC	N		ROC
Galeopsis tetrahit L.	LC	N		RUD
Galinsoga parviflora Cav.	NA	EA		RUD
Galinsoga quadriradiata Ruiz et Pav.	NA	EA		RUD
Galium aparine L.	LC	N		RUD
Galium boreale L.	CR	N	B2ab(i,iv)+D	ROC
Galium glaucum L.	RE	N		DRY
Galium mollugo L.	LC	N		GRA
Galium odoratum (L.) Scop.	LC	N		FOR
Galium palustre L.	LC	N		MAR
Galium pumilum Murray	VU	N	B2ab(i,iv)	DRY
Galium saxatile L.	LC	N		DRY
Galium spurium L.	CR	N	B2ab(i,iv)+D	RUD
Galium sylvaticum L.	VU	N	B2ab(i,iv)	FOR
Galium tricornutum Dandy	RE	N		RUD
Galium uliginosum L.	LC	N		MAR
Galium verum L.	LC	N		DRY
Genista anglica L.	CR	N	B2ab(i,iv)+D	DRY
Genista germanica L.	RE	N		DRY
Genista pilosa L.	LC	N		ROC
Genista sagittalis L.	NT	N		DRY
Genista tinctoria L.	LC	N		DRY
Gentiana cruciata L.	RE	N		DRY
Gentianella germanica (Willd.) Börner	EN	N	B2ab(i,iv)+C2a(i)b	DRY
Gentianopsis ciliata (L.) Ma	VU	N	A2c+B2ab(i,iv)	DRY
Geranium columbinum L.	LC	N		RUD
Geranium dissectum L.	LC	N		RUD
Geranium molle L.	LC	N		RUD
Geranium phaeum L.	NA	EA		FOR
Geranium pratense L.	VU	N	B2ab(i,iv)+C2a(i)	MAR
Geranium pusillum L.	LC	N		RUD
Geranium pyrenaicum Burm. f.	NA	EA		RUD
Geranium robertianum L.	LC	N		FOR
Geranium rotundifolium L.	VU	N	B2ab(i,iv)	ROC
Geranium sanguineum L.	VU	N	C2a(i)	DRY
Geranium sylvaticum L.	VU	N	B2ab(i,iv)+C2a(i)	FOR
Geum rivale L.	EN	N	B2ab(i,iv)	FOR
Geum urbanum L.	LC	N		FOR
Glebionis segetum (L.) Fourr.	NA	EA		RUD
Glechoma hederacea L.	LC	N		GRA
Glyceria declinata Bréb.	NT	N		FRE
Glyceria fluitans (L.) R. Brown	LC	N		FRE
Glyceria maxima (Hartm.) Holmberg	NT	N		FRE
Glyceria notata Chevall.	LC	N		FRE

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Gnaphalium sylvaticum L.	EN	N	B2ab(i,iv)	FOR
Gnaphalium uliginosum L.	LC	N		FRE
Goodyera repens (L.) R. Brown	NA	EA		FOR
Gratiola officinalis L.	RE	N		FRE
Groenlandia densa (L.) Fourr.	CR	N	B2ab(i,iv)	AQU
Gymnadenia conopsea (L.) R. Brown	NT	N		DRY
Gymnadenia odoratissima (L.) L.C.M. Rich.	RE	N		DRY
Gymnocarpium dryopteris (L.) Newman	NT	N		FOR
Gymnocarpium robertianum (Hoffmann) Newman	LC	N		ROC
Gypsophila muralis L.	EN	N	B2ab(i,iv)	FRE
Hedera helix L.	LC	N		FOR
Helianthemum nummularium (L.) Mill.	LC	N		DRY
Helianthus tuberosus L.	NA	EA		RUD
Helichrysum arenarium (L.) Moench	RE	N		DRY
Helictochloa pratensis (L.) Romero Zarco	VU	N	B2ab(i,iv)	DRY
Helleborus foetidus L.	EN	N	B2ab(i,iv)	FOR
Helleborus viridis subsp. *occidentalis* (Reut.) Schiffn.	RE	N		FOR
Helminthotheca echioides (L.) Holub	NA	EA		RUD
Helosciadium nodiflorum (L.) Koch	EN	N	B2ab(i,iv)	FRE
Heracleum mantegazzianum Somm. et Lev.	NA	EA		RUD
Heracleum sphondylium L.	LC	N		GRA
Herminium monorchis (L.) R. Brown	RE	N		DRY
Herniaria glabra L.	LC	N		RUD
Hesperis matronalis L.	NA	EA		FOR
Hieracium diaphanoides Lindeb.	DD	N		ROC
Hieracium glaucinum Jord.	EN	N	B2ab(i,iv)	ROC
Hieracium lachenalii C.C. Gmell.	DD	N		FOR
Hieracium laevigatum Willd.	VU	N	B2ab(i,iv)	FOR
Hieracium maculatum Schrank	VU	N	B2ab(i,iv)	ROC
Hieracium murorum L.	LC	N		FOR
Hieracium sabaudum L.	DD	N		FOR
Hieracium schmidtii Tausch	DD	N		ROC
Hieracium umbellatum L.	DD	N		FOR
Hieracium wiesbaurianum Uechtr.	DD	N		ROC
Hierochloe odorata (L.) Beauv.	RE	N		MAR
Himantoglossum hircinum (L.) Spreng.	LC	N		DRY
Hippocrepis comosa L.	LC	N		DRY
Hippocrepis emerus (L.) Lassen	NA	EA		FOR
Hippuris vulgaris L.	NA	EA		AQU
Holcus lanatus L.	LC	N		GRA
Holcus mollis L.	LC	N		FOR
Holosteum umbellatum L.	EN	N	B2ab(i,iv)	RUD
Hordelymus europaeus (L.) Jessen ex Harz	EN	N	B2ab(i,iv)	FOR
Hordeum jubatum L.	NA	EA		RUD
Hordeum murinum L.	NT	N		RUD
Hordeum secalinum Schreb.	NT	N		GRA
Humulus lupulus L.	LC	N		FOR

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Huperzia selago (L.) Bernh. ex Schrank et C.F.P. Mart.	RE	N		ROC
Hydrocharis morsus-ranae L.	NT	N		AQU
Hydrocotyle vulgaris L.	CR	N	B2ab(i,iv)	FRE
Hylotelephium telephium (L.) Ohba	NT	N		ROC
Hymenophyllum tunbrigense (L.) Smith	EN	N	B2ab(i,iv)	ROC
Hyoscyamus niger L.	CR	N	B2ab(i,iv)+D	RUD
Hypericum elodes L.	RE	N		MAR
Hypericum hirsutum L.	LC	N		FOR
Hypericum humifusum L.	LC	N		FOR
Hypericum maculatum Crantz subsp. *maculatum*	LC	N		MAR
Hypericum maculatum subsp. *obtusiusculum* (Tourlet) Hayek	EN	N	B2ab(i,iv)	MAR
Hypericum montanum L.	EN	N	B2ab(i,iv)	FOR
Hypericum perforatum L.	LC	N		DRY
Hypericum pulchrum L.	LC	N		FOR
Hypericum tetrapterum Fries	LC	N		MAR
Hypochaeris glabra L.	RE	N		DRY
Hypochaeris maculata L.	RE	N		DRY
Hypochaeris radicata L.	LC	N		DRY
Iberis amara L.	EN	N	B2ab(i,iv)	ROC
Ilex aquifolium L.	LC	N		FOR
Illecebrum verticillatum L.	CR	N	B2ab(i,iv)+D	FRE
Impatiens glandulifera Royle	NA	EA		FRE
Impatiens noli-tangere L.	LC	N		FOR
Impatiens parviflora DC.	NA	EA		FOR
Inula britannica L.	RE	N		FRE
Inula conyzae (Griesselich) DC.	LC	N		DRY
Inula salicina L.	LC	N		DRY
Iris pseudacorus L.	NT	N		MAR
Isatis tinctoria L.	NA	EA		RUD
Isolepis setacea (L.) R. Brown	LC	N		FRE
Jacobaea aquatica (Hill) P. Gaertn., B. Mey. et Scherb.	VU	N	A3c+B2ab(i,iv)	MAR
Jacobaea erucifolia (L.) P. Gaertn., B. Mey. et Scherb.	LC	N		DRY
Jacobaea vulgaris P. Gaertn.	LC	N		GRA
Jasione montana L.	NT	N		DRY
Juglans regia L.	NA	EA		FOR
Juncus acutiflorus Ehrh. ex Hoffmann	LC	N		MAR
Juncus articulatus L.	LC	N		MAR
Juncus bufonius L.	LC	N		FRE
Juncus bulbosus L.	VU	N	B2ab(i,iv)	MAR
Juncus capitatus Weigel	RE	N		FRE
Juncus compressus Jacq.	VU	N	B2ab(i,iv)	MAR
Juncus conglomeratus L.	LC	N		MAR
Juncus effusus L.	LC	N		MAR
Juncus filiformis L.	VU	N	B2ab(i,iv)+C1+C2a(i)	MAR
Juncus inflexus L.	LC	N		MAR
Juncus squarrosus L.	CR	N	B2ab(i,iv)+C2a(i)	MAR
Juncus subnodulosus Schrank	RE	N		MAR

Taxon	Threat category	Status	Criteria sub-heads	Habitat type
Juncus tenuis Willd.	NA	EA		FRE
Juniperus communis L.	VU	N	A2c+B2ab(i,iv)	DRY
Kickxia elatine (L.) Dum.	NT	N		RUD
Kickxia spuria (L.) Dum.	VU	N	B2ab(i,iv)	RUD
Knautia arvensis (L.) Coulter	LC	N		DRY
Koeleria macrantha (Ledeb.) Schult.	VU	N	C2a(i)	DRY
Koeleria pyramidata (Lam.) Beauv.	NT	N		DRY
Laburnum anagyroides Med.	NA	EA		FOR
Lactuca muralis (L.) Gaertn.	LC	N		FOR
Lactuca perennis L.	EN	N	B2ab(i,iv)	DRY
Lactuca saligna L.	CR	N	B2ab(i,iv)	RUD
Lactuca serriola L.	LC	N		RUD
Lactuca virosa L.	VU	N	B2ab(i,iv)	RUD
Lamium album L.	LC	N		RUD
Lamium amplexicaule L.	LC	N		RUD
Lamium galeobdolon (L.) L.	LC	N		FOR
Lamium maculatum L.	LC	N		FOR
Lamium purpureum L.	LC	N		RUD
Lapsana communis L.	LC	N		FOR
Lapsana communis subsp. *intermedia* (Bieb.) Hayek	NA	EA		RUD
Larix decidua Mill.	NA	EA		FOR
Laserpitium latifolium L.	RE	N		FOR
Lathraea squamaria L.	EN	N	B2ab(i,iv)	FOR
Lathyrus aphaca L.	VU	N	B2ab(i,iv)	RUD
Lathyrus hirsutus L.	EN	N	B2ab(i,iv)	RUD
Lathyrus latifolius L.	NA	EA		RUD
Lathyrus linifolius (Reichard) Bässler	LC	N		FOR
Lathyrus niger (L.) Bernh.	CR	N	B2ab(i,iv)	FOR
Lathyrus nissolia L.	VU	N	B2ab(i,iv)	RUD
Lathyrus pratensis L.	LC	N		GRA
Lathyrus sylvestris L.	LC	N		FOR
Lathyrus tuberosus L.	LC	N		RUD
Leersia oryzoides (L.) Swartz	CR	N	B2ab(i,iv)	FRE
Legousia speculum-veneris (L.) Chaix	EN	N	B2ab(i,iv)	RUD
Lemna gibba L.	EN	N	B2ab(i,iv)	AQU
Lemna minor L.	LC	N		AQU
Lemna minuta Kunth	NA	EA		AQU
Lemna trisulca L.	NT	N		AQU
Leontodon hispidus L.	LC	N		GRA
Leontodon saxatilis Lam.	EN	N	B2ab(i,iv)	ROC
Leonurus cardiaca L. subsp. *cardiaca*	EN	N	B2ab(i,iv)	RUD
Lepidium campestre (L.) R. Brown	LC	N		RUD
Lepidium coronopus (L.) Al-Shehbaz	VU	N	B2ab(i,iv)	RUD
Lepidium densiflorum Schrad.	EN	N	B2ab(i,iv)	RUD
Lepidium draba L.	NA	EA		RUD
Lepidium latifolium L.	EN	N	B2ab(i,iv)	FRE
Lepidium ruderale L.	EN	N	B2ab(i,iv)	RUD

Taxon	Threat category	Status	Criteria sub-heads	Habitat type
Leucanthemum ircutianum DC.	DD	N		GRA
Leucanthemum vulgare Lam.	LC	N		DRY
Leucojum vernum L.	NA	EA		FOR
Ligustrum vulgare L.	LC	N		FOR
Limodorum abortivum (L.) Swartz	RE	N		FOR
Limosella aquatica L.	CR	N	B2ab(i,iv)	FRE
Linaria arvensis (L.) Desf.	CR	N	B2ab(i,iv)	RUD
Linaria repens (L.) Mill.	VU	N	B2ab(i,iv)	ROC
Linaria vulgaris Mill.	LC	N		RUD
Linum austriacum L.	CR	N	B2ab(i,iv)	DRY
Linum catharticum L.	LC	N		DRY
Linum tenuifolium L.	EN	N	B2ab(i,iv)	DRY
Lipandra polysperma (L.) S. Fuentes, Uotila et Borsch	VU	N	B2ab(i,iv)	RUD
Lithospermum officinale L.	EN	N	B2ab(i,iv)	FOR
Logfia minima (Smith) Dum.	EN	N	B2ab(i,iv)	RUD
Lolium multiflorum Lam.	NA	EA		GRA
Lolium perenne L.	LC	N		GRA
Lolium remotum Schrank	RE	N		RUD
Lolium temulentum L.	RE	N		RUD
Loncomelos pyrenaicum (L.) Holub	EN	N	B2ab(i,iv)	FOR
Lonicera periclymenum L.	LC	N		FOR
Lonicera xylosteum L.	LC	N		FOR
Lotus corniculatus L.	LC	N		DRY
Lotus pedunculatus Cav.	LC	N		MAR
Lotus tenuis Waldst. et Kit. ex Willd.	EN	N	B2ab(i,iv)	MAR
Lunaria annua L.	NA	EA		RUD
Lunaria rediviva L.	CR	N	B2ab(i,iv)	FOR
Lupinus polyphyllus Lindl.	NA	EA		RUD
Luzula campestris (L.) DC.	LC	N		DRY
Luzula congesta (Thuil.) Lej.	EN	N	B2ab(i,iv)	FOR
Luzula luzuloides (Lam.) Dandy et Wilmott	LC	N		FOR
Luzula multiflora (Ehrh.) Lej.	LC	N		DRY
Luzula pilosa (L.) Willd.	LC	N		FOR
Luzula sylvatica (Huds.) Gaudin	LC	N		FOR
Lychnis viscaria L.	VU	N	B2ab(i,iv)	ROC
Lycium barbarum L.	NA	EA		ROC
Lycopodiella inundata (L.) Holub	RE	N		MAR
Lycopodium annotinum L.	CR	N	B2ab(i,iv)	FOR
Lycopodium clavatum L.	CR	N	B2ab(i,iv)+D	DRY
Lycopodium complanatum L.	RE	N		DRY
Lycopodium tristachyum Pursh	RE	N		DRY
Lycopsis arvensis L.	LC	N		RUD
Lycopus europaeus L.	LC	N		MAR
Lysimachia arvensis (L.) U. Manns et Anderb.	LC	N		RUD
Lysimachia foemina (Mill.) U. Manns et Anderb.	VU	N	B2ab(i,iv)	RUD
Lysimachia minima (L.) U. Manns et Anderb.	CR	N	B2ab(i,iv)	RUD
Lysimachia nemorum L.	LC	N		FOR

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Lysimachia nummularia L.	LC	N		GRA
Lysimachia punctata L.	NA	EA		FOR
Lysimachia vulgaris L.	LC	N		MAR
Lythrum hyssopifolia L.	VU	N	B2ab(i,iv)	FRE
Lythrum portula (L.) D.A. Webb	NT	N		FRE
Lythrum salicaria L.	LC	N		MAR
Maianthemum bifolium (L.) F.W. Schmidt	LC	N		FOR
Malus sylvestris (L.) Mill.	VU	N	B2ab(i,iv)	FOR
Malva alcea L.	VU	N	B2ab(i,iv)	RUD
Malva moschata L.	LC	N		DRY
Malva neglecta Wallr.	LC	N		RUD
Malva setigera Spenn.	NA	EA		RUD
Malva sylvestris L.	LC	N		RUD
Marrubium vulgare L.	NA	EA		RUD
Matricaria chamomilla L.	LC	N		RUD
Matricaria discoidea DC.	NA	EA		RUD
Matteuccia struthiopteris (L.) Tod.	NA	EA		FOR
Medicago arabica (L.) Huds.	LC	N		RUD
Medicago lupulina L.	LC	N		DRY
Medicago minima (L.) L.	VU	N	B2ab(i,iv)	DRY
Medicago polymorpha L.	NA	EA		RUD
Medicago sativa L. subsp. *sativa*	NA	EA		RUD
Medicago sativa subsp. *falcata* (L.) Arcang.	LC	N		DRY
Melampyrum arvense L.	VU	N	A2c+B2ab(i,iv)	DRY
Melampyrum cristatum L.	EN	N	B2ab(i,iv)	FOR
Melampyrum pratense L.	LC	N		FOR
Melica ciliata L.	EN	N	B2ab(i,iv)	ROC
Melica nutans L.	EN	N	B2ab(i,iv)	FOR
Melica uniflora Retz.	LC	N		FOR
Mentha aquatica L.	LC	N		MAR
Mentha arvensis L.	LC	N		MAR
Mentha longifolia (L.) Huds.	DD	N		FRE
Mentha pulegium L.	CR	N	B2ab(i,iv)	FRE
Mentha spicata L.	NA	EA		RUD
Mentha suaveolens Ehrh.	DD	N		FRE
Menyanthes trifoliata L.	VU	N	B2ab(i,iv)+C2a(i)	MAR
Mercurialis annua L.	LC	N		RUD
Mercurialis perennis L.	LC	N		FOR
Meum athamanticum Jacq.	CR	N	B2ab(i,iv)+C2a(i)	DRY
Microthlaspi perfoliatum (L.) F.K. Mey.	LC	N		RUD
Milium effusum L.	LC	N		FOR
Minuartia hybrida (Vill.) Schischkin	VU	N	B2ab(i,iv)	DRY
Misopates orontium (L.) Rafin.	VU	N	A2c+B2ab(i,iv)	RUD
Moehringia trinervia (L.) Clairv.	LC	N		FOR
Moenchia erecta (L.) Gaertn., B. Mey. et Scherb.	RE	N		DRY
Molinia caerulea (L.) Moench	LC	N		MAR
Monotropa hypopitys L.	VU	N	B2ab(i,iv)	FOR

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Montia arvensis Wallr.	CR	N	B2ab(i,iv)+C2a(i)	FRE
Montia fontana L.	LC	N		AQU
Myosotis arvensis (L.) Hill	LC	N		RUD
Myosotis discolor Pers.	NT	N		DRY
Myosotis laxa subsp. *cespitosa* (C.F. Schultz) Hyl. ex Nordh.	EN	N	B2ab(i,iv)	FRE
Myosotis nemorosa Besser	LC	N		MAR
Myosotis ramosissima Rochel	LC	N		DRY
Myosotis scorpioides L.	LC	N		MAR
Myosotis stricta Link ex Roem. et Schult.	VU	N	C2a(i)	DRY
Myosotis sylvatica Ehrh. ex Hoffmann	LC	N		FOR
Myosoton aquaticum (L.) Moench	LC	N		MAR
Myosurus minimus L.	EN	N	B2ab(i,iv)	RUD
Myriophyllum alterniflorum DC.	CR	N	B2ab(i,iv)	AQU
Myriophyllum aquaticum (Velloso) Verdc.	NA	EA		AQU
Myriophyllum spicatum L.	NT	N		AQU
Myriophyllum verticillatum L.	EN	N	B2ab(i,iv)	AQU
Myrrhis odorata (L.) Scop.	NA	EA		RUD
Najas marina L.	CR	N	B2ab(i,iv)	AQU
Narcissus pseudonarcissus L.	NT	N		FOR
Nardus stricta L.	EN	N	B2ab(i,iv)+C2a(i)	DRY
Nasturtium officinale R. Brown	NT	N		MAR
Neotinea ustulata (L.) R.M. Bateman, Pridgeon et M.W. Chase	RE	N		DRY
Neottia nidus-avis (L.) L.C.M. Rich.	LC	N		FOR
Neottia ovata (L.) Bluff et Fingerh.	LC	N		FOR
Nepeta cataria L.	NA	EA		RUD
Neslia paniculata (L.) Desv.	RE	N		RUD
Noccaea caerulescens (J. et C. Presl) F.K. Mey.	NT	N		DRY
Noccaea montana (L.) F.K. Mey.	RE	N		DRY
Nuphar lutea (L.) Smith	VU	N	B2ab(i,iv)	AQU
Nymphaea alba L.	NA	EA		AQU
Nymphoides peltata (S.G. Gmel.) O. Kuntze	EN	N	B2ab(i,iv)	AQU
Odontites vernus (Bellardi) Dum.	NT	N		RUD
Oenanthe aquatica (L.) Poiret	VU	N	B2ab(i,iv)	MAR
Oenanthe fistulosa L.	VU	N	B2ab(i,iv)	MAR
Oenanthe peucedanifolia Pollich	VU	N	B2ab(i,iv)+C2a(i)	MAR
Oenothera biennis L.	NA	EA		RUD
Oenothera glazioviana Micheli	NA	EA		RUD
Oenothera parviflora L.	NA	EA		RUD
Onobrychis viciifolia Scop.	LC	N		DRY
Ononis spinosa L. subsp. *spinosa*	DD	N		DRY
Ononis spinosa subsp. *procurrens* (Wallr.) Bonnier et Layens	LC	N		DRY
Onopordum acanthium L.	NA	EA		RUD
Ophioglossum vulgatum L.	VU	N	B2ab(i,iv)	MAR
Ophrys apifera Huds.	VU	N	C2a(i)	DRY
Ophrys aranifera Huds.	CR	N	B2ab(i,iv)+D	DRY
Ophrys fuciflora (F.W. Schmidt) Moench	VU	N	B2ab(i,iv)+C2a(i)	DRY
Ophrys insectifera L.	VU	N	B2ab(i,iv)+C2a(i)	DRY

Taxon	Threat category	Status	Criteria sub-heads	Habitat type
Orchis anthropophora (L.) All.	VU	N	C2a(i)	DRY
Orchis mascula (L.) L.	NT	N		DRY
Orchis militaris L.	VU	N	C2a(i)	DRY
Orchis purpurea Huds.	NT	N		FOR
Orchis simia Lam.	CR	N	B2ab(i,iv)+D	DRY
Oreopteris limbosperma (Bellardi ex All.) Holub	EN	N	B2ab(i,ii,iv)	FOR
Origanum vulgare L.	LC	N		DRY
Ornithogalum umbellatum L.	VU	N	B2ab(i,iv)	RUD
Ornithopus perpusillus L.	LC	N		ROC
Orobanche alba Steph. ex Willd.	VU	N	C2a(i)	DRY
Orobanche caryophyllacea Smith	EN	N	B2ab(i,iv)	DRY
Orobanche elatior Sutton	RE	N		DRY
Orobanche hederae Vaucher ex Duby	CR	N	B2ab(i,iv)+D	FOR
Orobanche minor Smith	CR	N	B2ab(i,iv)	RUD
Orobanche picridis F.W. Schultz	CR	N	B2ab(i,iv)+D	RUD
Orobanche rapum-genistae Thuill.	EN	N	B2ab(i,iv)	DRY
Orobanche teucrii Holandre	CR	N	B2ab(i,iv)	DRY
Orthilia secunda (L.) House	NA	EA		FOR
Osmunda regalis L.	CR	N	B2ab(i,iv)+D	FOR
Oxalis acetosella L.	LC	N		FOR
Oxalis corniculata L.	NA	EA		RUD
Oxalis stricta L.	NA	EA		RUD
Oxybasis glauca (L.) S. Fuentes, Uotila et Borsch	EN	N	B2ab(i,iv)	RUD
Oxybasis rubra (L.) S. Fuentes, Uotila et Borsch	EN	N	B2ab(i,iv)	RUD
Oxybasis urbica (L.) S. Fuentes, Uotila et Borsch	CR	N	B2ab(i,iv)	RUD
Panicum barbipulvinatum Nash	NA	EA		RUD
Panicum miliaceum L.	NA	EA		RUD
Papaver argemone L.	VU	N	B2ab(i,iv)+C1	RUD
Papaver dubium L.	NT	N		RUD
Papaver rhoeas L.	LC	N		RUD
Parietaria judaica L.	EN	N	B2ab(i,iv)	ROC
Parietaria officinalis L.	CR	N	B2ab(i,iv)+D	ROC
Paris quadrifolia L.	LC	N		FOR
Parnassia palustris L.	RE	N		MAR
Parthenocissus inserta (A. Kerner) Fritsch	NA	EA		RUD
Parthenocissus quinquefolia (L.) Planch.	NA	EA		RUD
Pastinaca sativa L.	LC	N		RUD
Pastinaca sativa subsp. *urens* (Req. ex Godr.) Čelak.	NA	EA		RUD
Paulownia tomentosa (Thunb.) Steud.	NA	EA		RUD
Pedicularis palustris L.	CR	N	A2c+B2ab(i,iv)	MAR
Pedicularis sylvatica L.	EN	N	A2c+B2ab(i,iv)+C1	DRY
Persicaria amphibia (L.) S.F. Gray	LC	N		AQU
Persicaria hydropiper (L.) Spach	LC	N		MAR
Persicaria lapathifolia (L.) Delarbre	LC	N		RUD
Persicaria maculosa S.F. Gray	LC	N		RUD
Persicaria minor (Huds.) Opiz	EN	N	B2ab(i,iv)	FRE
Persicaria mitis (Schrank) Asenov	CR	N	B2ab(i,iv)	FRE

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Petasites hybridus (L.) Gaeartn., B. Mey. et Scherb.	LC	N		FRE
Petrorhagia prolifera (L.) P.W. Ball et Heywood	NT	N		DRY
Phacelia tanacetifolia Benth.	NA	EA		RUD
Phalaris arundinacea L.	LC	N		MAR
Phegopteris connectilis (Michaux) Watt	VU	N	B2ab(i,iv)	FOR
Phelipanche purpurea (Jacq.) Soják	VU	N	B2ab(i,iv)	DRY
Phelipanche ramosa (L.) Pomel	RE	N		RUD
Phleum nodosum L.	NT	N		DRY
Phleum phleoides (L.) Karst.	EN	N	B2ab(i,iv)	DRY
Phleum pratense L.	LC	N		GRA
Phragmites australis (Cav.) Trin. ex Steud.	LC	N		MAR
Phyteuma nigrum F.W. Schmidt	LC	N		FOR
Phyteuma spicatum L.	LC	N		FOR
Picea abies (L.) Karst.	NA	EA		FOR
Picris hieracioides L.	LC	N		RUD
Pilosella aurantiaca (L.) F.W. Schultz et Schultz-Bip.	NA	EA		GRA
Pilosella bauhini (Schult.) Arv.-Touv.	VU	N	B2ab(i,iv)	ROC
Pilosella caespitosa (Dum.) P.D. Sell et C. West	EN	N	B2ab(i,iv)	RUD
Pilosella lactucella (Wallr.) P.D. Sell et C. West	LC	N		DRY
Pilosella officinarum F.W. Schultz et Schultz-Bip.	LC	N		DRY
Pilosella piloselloides (Vill.) Soják	VU	N	B2ab(i,iv)	ROC
Pilosella ziziana (Tausch) F.W. Schultz et Schultz-Bip.	DD	N		ROC
Pimpinella major (L.) Huds.	LC	N		GRA
Pimpinella saxifraga L.	LC	N		DRY
Pinus nigra Arnold	NA	EA		FOR
Pinus sylvestris L.	EN	N	B2ab(i,iv)	FOR
Plantago coronopus L.	NA	EA		RUD
Plantago lanceolata L.	LC	N		GRA
Plantago major L. subsp. *major*	LC	N		RUD
Plantago major subsp. *pleiosperma* Pilg.	DD	N		FRE
Plantago media L.	LC	N		DRY
Platanthera bifolia (L.) L.C.M. Rich.	NT	N		FOR
Platanthera chlorantha (Cust.) Reichenb.	NT	N		FOR
Poa annua L.	LC	N		RUD
Poa bulbosa L.	CR	N	B2ab(i,iv)	DRY
Poa chaixii Vill.	EN	N	B2ab(i,iv)	FOR
Poa compressa L.	LC	N		ROC
Poa nemoralis L.	LC	N		FOR
Poa palustris L.	LC	N		MAR
Poa pratensis L. subsp. *pratensis*	LC	N		GRA
Poa pratensis subsp. *angustifolia* (L.) Gaudin	LC	N		ROC
Poa pratensis subsp. *irrigata* (Lindm.) Lindb.	LC	N		FOR
Poa trivialis L.	LC	N		GRA
Podospermum laciniatum (L.) DC.	RE	N		RUD
Polemonium caeruleum L.	NA	EA		MAR
Polycnemum majus A. Braun	RE	N		RUD
Polygala amarella Crantz	CR	N	B2ab(i,iv)	DRY

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Polygala calcarea F.W. Schultz	VU	N	A2c+B2ab(i,iv)	DRY
Polygala comosa Schkuhr	NT	N		DRY
Polygala serpyllifolia Hose	VU	N	B2ab(i,iv)	DRY
Polygala vulgaris L.	LC	N		DRY
Polygonatum multiflorum (L.) All.	LC	N		FOR
Polygonatum odoratum (Mill.) Druce	EN	N	B2ab(i,iv)	FOR
Polygonatum verticillatum (L.) All.	LC	N		FOR
Polygonum aviculare L.	LC	N		FOR
Polypodium interjectum Shivas	LC	N		ROC
Polypodium ×mantoniae Rothm.	DD	N		ROC
Polypodium vulgare L.	LC	N		ROC
Polystichum aculeatum (L.) Roth	NT	N		FOR
Polystichum ×bicknellii (Christ) Hahne	EN	N	B2ab(i,iv)	FOR
Polystichum lonchitis (L.) Roth	CR	N	B2ab(i,iv)	FOR
Polystichum setiferum (Forssk.) T. Moore ex Woynar	EN	N	B2ab(i,iv)	FOR
Populus ×canadensis Moench	NA	EA		FOR
Populus ×canescens (Ait.) Smith	NA	EA		FOR
Populus nigra L.	NA	EA		FOR
Populus tremula L.	LC	N		FOR
Portulaca oleracea L.	LC	N		RUD
Potamogeton alpinus Balb.	RE	N		AQU
Potamogeton berchtoldii Fieb.	EN	N	B2ab(i,iv)	AQU
Potamogeton crispus L.	LC	N		AQU
Potamogeton lucens L.	CR	N	B2ab(i,iv)+D	AQU
Potamogeton natans L.	LC	N		AQU
Potamogeton nodosus Poiret	DD	N		AQU
Potamogeton obtusifolius Mert. et Koch	CR	N	B2ab(i,iv)+D	AQU
Potamogeton perfoliatus L.	DD	N		AQU
Potamogeton polygonifolius Pourr.	VU	N	B2ab(i,iv)	AQU
Potamogeton pusillus L.	EN	N	B2ab(i,iv)	AQU
Potamogeton trichoides Cham. et Schlecht.	EN	N	B2ab(i,iv)	AQU
Potentilla anglica Laichard.	VU	N	B2ab(i,iv)	DRY
Potentilla argentea L.	LC	N		DRY
Potentilla erecta (L.) Räuschel	NT	N		DRY
Potentilla indica (Andrews) Th. Wolf	NA	EA		RUD
Potentilla intermedia L.	NA	EA		RUD
Potentilla leucopolitana P.J. Muell.	RE	N		DRY
Potentilla ×neumanniana Reichenb.	DD	N		ROC
Potentilla norvegica L.	NA	EA		RUD
Potentilla recta L.	NA	EA		RUD
Potentilla reptans L.	LC	N		RUD
Potentilla sterilis (L.) Garcke	LC	N		FOR
Potentilla supina L.	CR	N	B2ab(i,iv)	FRE
Potentilla verna L.	LC	N		DRY
Poterium sanguisorba L.	LC	N		DRY
Prenanthes purpurea L.	RE	N		FOR
Primula elatior (L.) Hill	LC	N		FOR

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Primula veris L.	LC	N		DRY
Prunella grandiflora Huds.	RE	N		DRY
Prunella laciniata (L.) L.	NT	N		DRY
Prunella vulgaris L.	LC	N		GRA
Prunus avium (L.) L.	LC	N		FOR
Prunus laurocerasus L.	NA	EA		FOR
Prunus mahaleb L.	VU	N	B2ab(i,iv)	FOR
Prunus padus L.	LC	N		FOR
Prunus serotina Ehrh.	NA	EA		FOR
Prunus spinosa L.	LC	N		FOR
Pseudofumaria lutea (L.) Borkh.	NA	EA		ROC
Pteridium aquilinum (L.) Kuhn	LC	N		FOR
Puccinellia distans (Jacq.) Parl.	NA	EA		RUD
Pulicaria dysenterica (L.) Bernh.	LC	N		MAR
Pulicaria vulgaris Gaertn.	RE	N		FRE
Pulmonaria montana Lej.	VU	N	B2ab(i,iv)	FOR
Pulmonaria obscura Dum.	NT	N		FOR
Pulmonaria officinalis L.	NA	EA		FOR
Pyrola media Swartz	RE	N		FOR
Pyrola minor L.	VU	N	B2ab(i,iv)	FOR
Pyrola rotundifolia L.	NT	N		FOR
Pyrus communis subsp. *pyraster* (L.) Ehrh.	NT	N		FOR
Quercus petraea Lieblein	LC	N		FOR
Quercus pubescens Willd.	CR	N	B2ab(i,iv)+D	DRY
Quercus robur L.	LC	N		FOR
Quercus rubra L.	NA	EA		FOR
Radiola linoides Roth	RE	N		FRE
Ranunculus acris L.	LC	N		GRA
Ranunculus aquatilis L.	NT	N		AQU
Ranunculus arvensis L.	EN	N	B2ab(i,iv)	RUD
Ranunculus auricomus L.	LC	N		FOR
Ranunculus bulbosus L.	LC	N		DRY
Ranunculus circinatus Sibth.	EN	N	B2ab(i,iv)	AQU
Ranunculus flammula L.	LC	N		MAR
Ranunculus fluitans Lam.	NT	N		AQU
Ranunculus hederaceus L.	VU	N	B2ac(iii)	MAR
Ranunculus lingua L.	VU	N	B2ab(i,iv)	FRE
Ranunculus peltatus Schrank	NT	N		AQU
Ranunculus penicillatus (Dum.) Bab.	NT	N		AQU
Ranunculus platanifolius L.	CR	N	B2ab(i,iv)	FOR
Ranunculus polyanthemoides Boreau	RE	N		DRY
Ranunculus repens L.	LC	N		MAR
Ranunculus sardous Crantz	VU	N	B2ab(i,iv)	RUD
Ranunculus sceleratus L.	VU	N	B2ab(i,iv)+C2a(i)	MAR
Ranunculus serpens Schrank	EN	N	B2ab(i,iv)	FOR
Ranunculus trichophyllus Chaix	VU	N	B2ab(i,iv)	AQU
Raphanus raphanistrum L.	CR	N	B2ab(i,iv)	RUD

Taxon	Threat category	Status	Criteria sub-heads	Habitat type
Reseda lutea L.	LC	N		RUD
Reseda luteola L.	NT	N		RUD
Reynoutria ×bohemica Chrtek et Chrtková	NA	EA		RUD
Reynoutria japonica Houtt.	NA	EA		RUD
Reynoutria sachalinensis (F. Schmidt Petrop.) Nakai	NA	EA		RUD
Rhamnus cathartica L.	NT	N		FOR
Rhinanthus alectorolophus (Scop.) Pollich	EN	N	B2ab(i,iv)+C2a(i)	DRY
Rhinanthus angustifolius C.C. Gmel.	CR	N	B2ab(i,iv)	DRY
Rhinanthus minor L.	LC	N		MAR
Rhus typhina L.	NA	EA		RUD
Rhynchospora alba (L.) Vahl	RE	N		MAR
Ribes alpinum L.	VU	N	B2ab(i,iv)	FOR
Ribes nigrum L.	EN	N	B2ab(i,iv)	FOR
Ribes rubrum L.	LC	N		FOR
Ribes uva-crispa L.	LC	N		FOR
Robinia pseudoacacia L.	NA	EA		FOR
Rorippa amphibia (L.) Besser	VU	N	B2ab(i,iv)	FRE
Rorippa palustris (L.) Besser	NT	N		FRE
Rorippa stylosa (Pers.) Mansf. et Rothm.	CR	N	B2ab(i,iv)	DRY
Rorippa sylvestris (L.) Besser	EN	N	B2ab(i,iv)	FRE
Rosa arvensis Huds.	LC	N		FOR
Rosa canina L.	LC	N		FOR
Rosa corymbifera Borkh.	NA	EA		FOR
Rosa micrantha Borrer ex Smith	EN	N	B2ab(i,iv)	FOR
Rosa rubiginosa L.	VU	N	B2ab(i,iv)	FOR
Rosa rugosa Thunb.	NA	EA		RUD
Rosa spinosissima L.	VU	N	B2ab(i,iv)	DRY
Rosa stylosa Desv.	RE	N		FOR
Rosa tomentella Léman	EN	N	B2ab(i,iv)	FOR
Rosa tomentosa Smith	VU	N	B2ab(i,iv)	FOR
Rosa villosa L.	EN	N	B2ab(i,iv)	FOR
Rubus aetnicus Weston	LC	N		FOR
Rubus ambulans Matzke-Hajek	LC	N		FOR
Rubus arduennensis Libert ex Lej.	LC	N		FOR
Rubus armeniacus Focke	NA	EA		FOR
Rubus bertramii G. Braun	NT	N		FOR
Rubus bifrons Vest	LC	N		FOR
Rubus bonus-henricus Matzke-Hajek	NT	N		FOR
Rubus caesius L.	LC	N		FOR
Rubus camptostachys G. Braun	DD	N		FOR
Rubus caninitergi H.E. Weber	NT	N		FOR
Rubus condensatus P.J. Muell.	LC	N		FOR
Rubus constrictus Lef. et P.J. Muell.	DD	N		FOR
Rubus cuspidatus P.J. Muell.	LC	N		FOR
Rubus dechenii Wirtg.	LC	N		FOR
Rubus delectus P.J. Muell. et Wirtg.	NT	N		FOR
Rubus echinosepalus H.E. Weber	LC	N		FOR

Taxon	Threat category	Status	Criteria sub-heads	Habitat type
Rubus eifeliensis Wirtg.	NT	N		FOR
Rubus erubescens Wirtg.	DD	N		FOR
Rubus favonii W.C.R. Watson	LC	N		FOR
Rubus flaccidus P.J. Muell.	DD	N		FOR
Rubus fuscus Weihe	NT	N		FOR
Rubus grabowskii Weihe	LC	N		FOR
Rubus gracilis J. Presl et C. Presl	DD	N		FOR
Rubus hadracanthos G. Braun	LC	N		FOR
Rubus holandrei P.J. Muell.	DD	N		FOR
Rubus hoplotheca A. Beek et D.F. Mercier	DD	N		FOR
Rubus hostilis P.J. Muell. et Wirtg.	DD	N		FOR
Rubus idaeus L.	LC	N		FOR
Rubus ignoratus H.E. Weber	NT	N		FOR
Rubus imbellis Matzke-Hajek	DD	N		FOR
Rubus integribasis P.J. Muell. ex Boulay	DD	N		FOR
Rubus laciniatus Willd.	NA	EA		FOR
Rubus langei G. Jensen ex Frid. et Gelert	DD	N		FOR
Rubus leucophaeus P.J. Muell.	DD	N		FOR
Rubus loehrii Wirtg.	LC	N		FOR
Rubus macrodontus P.J. Muell.	NT	N		FOR
Rubus macrophyllus Weihe et Nees	NT	N		FOR
Rubus macrostemonides Fritsch	NT	N		FOR
Rubus melanoxylon P.J. Muell. et Wirtg.	DD	N		FOR
Rubus micans Godr. in Gren. et Godr.	DD	N		FOR
Rubus montanus Libert ex Lej.	LC	N		FOR
Rubus negatus A. Beek	DD	N		FOR
Rubus nemorosus Hayne et Wildenow	DD	N		FOR
Rubus nessensis W. Hall	LC	N		FOR
Rubus nigricans Danthoine	LC	N		FOR
Rubus oblongifolius P.J. Muell. et Wirtg.	LC	N		FOR
Rubus omalodontos P.J. Muell. et Wirtg.	NT	N		FOR
Rubus oreades P.J. Muell. et Wirtg.	NT	N		FOR
Rubus orthostachys G. Braun	NT	N		FOR
Rubus pannosus P.J. Muell. et Wirtg.	NT	N		FOR
Rubus pedica Matzke-Hajek	NT	N		FOR
Rubus perperus H.E. Weber	NT	N		FOR
Rubus plicatus Weihe et Nees	LC	N		FOR
Rubus praestans H.E. Weber	NT	N		FOR
Rubus procerus P.J. Muell. ex Boulay	LC	N		FOR
Rubus radula Weihe	NT	N		FOR
Rubus ripuaricus Matzke-Hajek	DD	N		FOR
Rubus roberti Matzke-Hajek	DD	N		FOR
Rubus rosaceus Weihe	NT	N		FOR
Rubus rudis Weihe	LC	N		FOR
Rubus saltuum Focke	NT	N		FOR
Rubus saxatilis L.	DD	N		FOR
Rubus saxicola P.J. Muell.	LC	N		FOR

Taxon	Threat category	Status	Criteria sub-heads	Habitat type
Rubus scabrosus P.J. Muell.	NT	N		FOR
Rubus scissoides H.E. Weber	NT	N		FOR
Rubus scissus W.C.R. Watson	DD	N		FOR
Rubus sprengelii Weihe	LC	N		FOR
Rubus stereacanthos P.J. Muell. ex Boulay	LC	N		FOR
Rubus sulcatus Vest	NT	N		FOR
Rubus transvestitus Matzke-Hajek	DD	N		FOR
Rubus umbrosus (Weihe) Arrh.	LC	N		FOR
Rubus vestitus Weihe	LC	N		FOR
Rubus viscosus Weihe ex Lej. et Court.	LC	N		FOR
Rubus wirtgenii Auersw. ex Wirtg.	NT	N		FOR
Rumex acetosa L.	LC	N		GRA
Rumex acetosella L.	LC	N		DRY
Rumex conglomeratus Murray	LC	N		RUD
Rumex crispus L.	LC	N		RUD
Rumex hydrolapathum Huds.	VU	N	B2ab(i,iv)	FRE
Rumex maritimus L.	CR	N	B2ab(i,iv)	FRE
Rumex obtusifolius L.	LC	N		GRA
Rumex sanguineus L.	LC	N		FOR
Rumex scutatus L.	NA	EA		ROC
Sagina apetala Ard.	NT	N		ROC
Sagina nodosa (L.) Fenzl	RE	N		MAR
Sagina procumbens L.	LC	N		ROC
Sagittaria sagittifolia L.	CR	N	B2ab(i,iv)	FRE
Salix alba L.	LC	N		FRE
Salix aurita L.	LC	N		MAR
Salix caprea L.	LC	N		FOR
Salix cinerea L.	LC	N		MAR
Salix ×fragilis L.	LC	N		FRE
Salix pentandra L.	NA	EA		FRE
Salix purpurea var. *lambertiana* (Smith) Koch	EN	N	B2ab(i,iv)	FOR
Salix repens L.	RE	N		MAR
Salix triandra L.	EN	N	B2ab(i,iv)	FRE
Salix viminalis L.	LC	N		FRE
Salvia nemorosa L.	NA	EA		RUD
Salvia pratensis L.	EN	N	B2ab(i,iv)+C2a(i)	DRY
Salvia verticillata L.	NA	EA		RUD
Sambucus ebulus L.	LC	N		FOR
Sambucus nigra L.	LC	N		FOR
Sambucus racemosa L.	LC	N		FOR
Sanguisorba officinalis L.	VU	N	B2ab(i,iv)+C2a(i)	MAR
Sanicula europaea L.	NT	N		FOR
Saponaria officinalis L.	LC	N		RUD
Saxifraga granulata L.	LC	N		DRY
Saxifraga rosacea subsp. *sponhemica* (C.C. Gmel.) D.A. Webb	EN	N	B2ab(i,iv)	ROC
Saxifraga tridactylites L.	NT	N		ROC
Scabiosa columbaria L. subsp. *columbaria*	LC	N		DRY

Taxon	Threat category	Status	Criteria sub-heads	Habitat type
Scabiosa columbaria subsp. *pratensis* (Jord.) Br.-Bl.	EN	N	B2ab(i,iv)	DRY
Scandix pecten-veneris L.	RE	N		RUD
Schedonorus arundinaceus (Schreb.) Dum.	LC	N		MAR
Schedonorus giganteus (L.) Holub	LC	N		FOR
Schedonorus pratensis (Huds.) P. Beauv.	LC	N		GRA
Schoenoplectus lacustris (L.) Palla	VU	N	B2ab(i,iv)+C2a(i)	FRE
Schoenoplectus tabernaemontani (C.C. Gmel.) Palla	EN	N	B2ab(i,iv)+C2a(i)	MAR
Schoenoplectus triqueter (L.) Palla	RE	N		FRE
Scilla bifolia L.	VU	N	B2ab(i,iv)	FOR
Scirpus sylvaticus L.	LC	N		MAR
Scleranthus annuus L.	LC	N		RUD
Scleranthus perennis L.	LC	N		ROC
Sclerochloa dura (L.) Beauv.	NA	EA		RUD
Scorzonera humilis L.	EN	N	A2c+B2ab(i,iv)	MAR
Scorzoneroides autumnalis (L.) Moench	LC	N		GRA
Scrophularia auriculata L.	VU	N	B2ab(i,iv)	FRE
Scrophularia nodosa L.	LC	N		FOR
Scrophularia umbrosa Dum.	LC	N		FRE
Scutellaria galericulata L.	LC	N		MAR
Scutellaria minor Huds.	EN	N	B2ab(i,iv)	MAR
Sedum acre L.	LC	N		ROC
Sedum album L.	LC	N		ROC
Sedum forsterianum Smith	LC	N		DRY
Sedum rubens L.	RE	N		ROC
Sedum rupestre L.	LC	N		ROC
Sedum sexangulare L.	NT	N		ROC
Selinum carvifolia (L.) L.	VU	N	A2c+A3c+B2ab(i,iv)	MAR
Sempervivum tectorum L.	NA	EA		ROC
Senecio inaequidens DC.	NA	EA		RUD
Senecio ovatus (P. Gaertn., B. Mey. et Scherb.) Willd.	LC	N		FOR
Senecio sarracenicus L.	RE	N		FRE
Senecio sylvaticus L.	LC	N		FOR
Senecio vernalis Waldst. et Kit.	NA	EA		RUD
Senecio viscosus L.	LC	N		RUD
Senecio vulgaris L.	LC	N		RUD
Serratula tinctoria L.	CR	N	B2ab(i,iv)	DRY
Seseli annuum L.	CR	N	B2ab(i,iv)	DRY
Seseli libanotis (L.) Koch	EN	N	B2ab(i,iv)	ROC
Sesleria caerulea (L.) Ard.	EN	N	B2ab(i,iv)	DRY
Setaria italica (L.) Beauv.	NA	EA		RUD
Setaria pumila (Poiret) Roem. et Schult.	NT	N		RUD
Setaria verticillata (L.) Beauv.	DD	N		RUD
Setaria viridis (L.) Beauv.	NT	N		RUD
Sherardia arvensis L.	VU	N	C2a(i)	RUD
Silaum silaus (L.) Schinz et Thell.	LC	N		MAR
Silene conica L.	RE	N		DRY
Silene dichotoma Ehrh.	RE	EA		RUD

Taxon	Threat category	Status	Criteria sub-heads	Habitat type
Silene dioica (L.) Clairv.	LC	N		FOR
Silene flos-cuculi (L.) Greuter et Burdet	LC	N		MAR
Silene flos-jovis (L.) Greuter & Burdet	NA	EA		RUD
Silene latifolia subsp. *alba* (Mill.) Greuter et Burdet	LC	N		RUD
Silene noctiflora L.	CR	N	B2ab(i,iv)	RUD
Silene nutans L.	NT	N		ROC
Silene vulgaris (Moench) Garcke	LC	N		FOR
Sinapis alba L.	NA	EA		RUD
Sinapis arvensis L.	LC	N		RUD
Sisymbrium altissimum L.	NA	EA		RUD
Sisymbrium officinale (L.) Scop.	LC	N		RUD
Solanum dulcamara L.	LC	N		FRE
Solanum nigrum L.	LC	N		RUD
Solidago canadensis L.	NA	EA		RUD
Solidago gigantea Ait.	NA	EA		RUD
Solidago virgaurea L.	LC	N		FOR
Sonchus arvensis L.	LC	N		RUD
Sonchus asper (L.) Hill	LC	N		RUD
Sonchus oleraceus L.	LC	N		MAR
Sorbus aria (L.) Crantz	LC	N		FOR
Sorbus aucuparia L.	LC	N		FOR
Sorbus latifolia (Lam.) Pers.	RE	N		FOR
Sorbus torminalis (L.) Crantz	NT	N		FOR
Sparganium emersum Rehm.	VU	N	B2ab(i,iv)	AQU
Sparganium erectum L.	LC	N		AQU
Sparganium natans L.	RE	N		AQU
Spergula arvensis L.	VU	N	B2ab(i,iv)	RUD
Spergula morisonii Boreau	RE	N		DRY
Spergula pentandra L.	RE	N		RUD
Spergularia marina (L.) Besser	NA	EA		RUD
Spergularia rubra (L.) J. et C. Presl	LC	N		ROC
Spiraea alba Du Roi	NA	EA		FRE
Spiraea ×billardii Hérincq	NA	EA		RUD
Spiraea douglasii Hook.	NA	EA		RUD
Spirodela polyrhiza (L.) Schleid.	LC	N		AQU
Stachys alpina L.	VU	N	B2ab(i,iv)	FOR
Stachys annua (L.) L.	CR	N	B2ab(iv)	RUD
Stachys arvensis (L.) L.	VU	N	B2ab(i,iv)	RUD
Stachys germanica L.	CR	N	B2ab(i,iv)+D	DRY
Stachys palustris L.	LC	N		MAR
Stachys recta L.	NT	N		DRY
Stachys sylvatica L.	LC	N		FOR
Stellaria alsine Grimm	LC	N		MAR
Stellaria graminea L.	LC	N		DRY
Stellaria holostea L.	LC	N		FOR
Stellaria media (L.) Vill.	LC	N		RUD
Stellaria nemorum L.	LC	N		FOR

Taxon	Threat category	Status	Criteria sub-heads	Habitat type
Stellaria palustris Retz.	EN	N	B2ab(i,iv)	MAR
Stuckenia pectinata (L.) Börner	VU	N	B2ab(i,iv)	AQU
Succisa pratensis Moench	NT	N		MAR
Symphyotrichum lanceolatum (Willd.) Nesom	NA	EA		RUD
Symphyotrichum novi-belgii (L.) Nesom	NA	EA		RUD
Symphytum officinale L.	LC	N		FRE
Syringa vulgaris L.	NA	EA		ROC
Tanacetum parthenium (L.) Schultz-Bip.	NA	EA		RUD
Tanacetum vulgare L.	LC	N		RUD
Taraxacum adamii auct. non Claire	DD	N		GRA
Taraxacum alatum Lindb. f.	DD	N		GRA
Taraxacum anglicum Dahlst.	DD	N		MAR
Taraxacum copidophyllum Dahlst.	DD	N		GRA
Taraxacum dahlstedtii Lindb. f.	DD	N		GRA
Taraxacum dilatatum Lindb. f.	DD	N		GRA
Taraxacum ekmanii Dahlst.	DD	N		GRA
Taraxacum haematicum G.E. Haglund ex H. Øllg. & Wittzell	DD	N		GRA
Taraxacum hollandicum v. Soest	DD	N		GRA
Taraxacum lacistophylloides Dahlst.	DD	N		MAR
Taraxacum lacistophyllum (Dahlst.) Raunk.	DD	N		ROC
Taraxacum ochrochlorum G.E. Haglund	DD	N		ROC
Taraxacum parnassicum Dahlst.	DD	N		ROC
Taraxacum pectinatiforme Lindb. f.	DD	N		GRA
Taraxacum reichlingii v. Soest	RE	N		MAR
Taraxacum rivulare v. Soest	RE	N		GRA
Taraxacum rubicundum (Dahlst.) Dahlst.	DD	N		ROC
Taraxacum scanicum Dahlst.	DD	N		ROC
Taraxacum sellandii Dahlst.	DD	N		GRA
Taraxacum subpallidissimum v. Soest	DD	N		GRA
Taraxacum subundulatum Dahlst.	DD	N		GRA
Taraxacum tortilobum Florstr.	DD	N		GRA
Taraxacum trilobatum Palmgr.	DD	N		ROC
Taraxacum undulatiforme Dahlst.	DD	N		GRA
Taraxacum undulatum Lindb. f. et Markl.	DD	N		GRA
Taxus baccata L.	NA	EA		FOR
Teesdalia nudicaulis (L.) R. Brown	LC	N		ROC
Tephroseris helenitis (L.) Nordenstram	EN	N	B2ab(i,iv)	FOR
Teucrium botrys L.	VU	N	B2ab(i,iv)	ROC
Teucrium chamaedrys L.	NT	N		DRY
Teucrium montanum L.	RE	N		DRY
Teucrium scorodonia L.	LC	N		FOR
Thalictrum flavum L.	EN	N	B2ab(i,iv)	MAR
Thalictrum minus subsp. *pratense* (F.W. Schultz) Hand	EN	N	B2a+B2b(iv)+D	DRY
Thelypteris palustris Schott	CR	N	B2a+B2b(iv)+D	MAR
Thesium pyrenaicum Pourr.	CR	N	B2ab(i,iv)	DRY
Thlaspi arvense L.	LC	N		RUD
Thymelaea passerina (L.) Coss. et Germ.	RE	N		RUD

Taxon	Threat category	Status	Criteria sub-heads	Habitat type
Thymus praecox Opiz	NT	N		ROC
Thymus pulegioides L.	LC	N		DRY
Tilia cordata Mill.	NT	N		FOR
Tilia platyphyllos Scop.	LC	N		FOR
Torilis arvensis (Huds.) Link	EN	N	B2ab(i,iv)	RUD
Torilis japonica (Houtt.) DC.	LC	N		FOR
Tragopogon dubius Scop.	NA	EA		RUD
Tragopogon pratensis L.	LC	N		DRY
Tragopogon pratensis subsp. *orientalis* (L.) Čelak.	EN	N	B2ab(i,iv)	DRY
Trifolium alpestre L.	RE	N		DRY
Trifolium arvense L.	LC	N		DRY
Trifolium aureum Pollich	VU	N	C2a(i)	DRY
Trifolium campestre Schreb.	LC	N		DRY
Trifolium dubium Sibth.	LC	N		GRA
Trifolium fragiferum L.	VU	N	C2a(i)	DRY
Trifolium hybridum L.	LC	N		GRA
Trifolium incarnatum L.	NA	EA		RUD
Trifolium medium L.	LC	N		DRY
Trifolium montanum L.	LC	N		DRY
Trifolium ochroleucon Huds.	EN	N	B2ab(i,iv)	DRY
Trifolium pratense L.	LC	N		GRA
Trifolium repens L.	LC	N		GRA
Trifolium rubens L.	EN	N	B2ab(i,iv)	DRY
Trifolium striatum L.	VU	N	C2a(i)	DRY
Triglochin palustris L.	EN	N	B2ab(i,iv)	MAR
Trigonella alba (Med.) Coulot et Rabaute	LC	N		RUD
Trigonella altissima (Thuill.) Coulot et Rabaute	EN	N	B2ab(i,iv)	RUD
Trigonella officinalis (L.) Coulot et Rabaute	LC	N		RUD
Tripleurospermum maritimum (L.) Koch	LC	N		RUD
Trisetum flavescens (L.) Beauv.	LC	N		GRA
Turgenia latifolia (L.) Hoffmann	RE	N		RUD
Turritis glabra L.	LC	N		FOR
Tussilago farfara L.	LC	N		RUD
Typha angustifolia L.	NT	N		FRE
Typha latifolia L.	LC	N		FRE
Ulex europaeus L.	NA	EA		FOR
Ulmus glabra Huds.	NT	N		FOR
Ulmus laevis Pallas	EN	N	B2ab(i,iv)	FOR
Ulmus minor Mill.	VU	N	B2ab(i,iv)	FOR
Urtica dioica L.	LC	N		RUD
Urtica urens L.	VU	N	B2ab(i,iv)	RUD
Utricularia australis R. Brown	EN	N	B2ab(i,iv)	AQU
Utricularia vulgaris L.	EN	N	B2ab(i,iv)	AQU
Vaccaria hispanica (Mill.) Rauschert	CR	N	B2ab(i,iv)	RUD
Vaccinium myrtillus L.	LC	N		FOR
Vaccinium oxycoccos L.	CR	N	B2ab(iv)+C2a(i)+D	MAR
Vaccinium vitis-idaea L.	RE	N		DRY

Taxon	Threat category	Status	Criteria sub-heads	Habitat type
Valeriana dioica L.	VU	N	A2c+A3c+B2ab(i,iv)	MAR
Valeriana officinalis subsp. *repens* (Host) O. Bolòs et Vigo	LC	N		MAR
Valeriana officinalis subsp. *tenuifolia* (Vahl) Schübl. et Martens	NT	N		FOR
Valerianella carinata Loisel.	EN	N	B2ab(i,iv)	RUD
Valerianella dentata (L.) Pollich	EN	N	B2ab(i,iv)	RUD
Valerianella locusta (L.) Laterr.	LC	N		RUD
Valerianella rimosa Bast.	EN	N	B2ab(i,iv)	RUD
Vallisneria spiralis L.	CR	N	B2ab(i,iv)	AQU
Vandenboschia speciosa (Willd.) Kunkel	LC	N		ROC
Verbascum blattaria L.	EN	N	B2ab(i,iv)	RUD
Verbascum densiflorum Bertol.	VU	N	B2ab(i,iv)	RUD
Verbascum lychnitis L.	LC	N		ROC
Verbascum nigrum L.	LC	N		RUD
Verbascum phlomoides L.	VU	N	B2ab(i,iv)	RUD
Verbascum pulverulentum Vill.	CR	N	B2ab(i,iv)	ROC
Verbascum thapsus L.	LC	N		RUD
Verbena officinalis L.	LC	N		RUD
Veronica agrestis L.	NT	N		RUD
Veronica anagallis-aquatica L.	EN	N	B2ab(i,iv)	FRE
Veronica arvensis L.	LC	N		RUD
Veronica beccabunga L.	LC	N		FRE
Veronica catenata Pennell	EN	N	B2ab(i,iv)	FRE
Veronica chamaedrys L.	LC	N		DRY
Veronica filiformis Smith	NA	EA		RUD
Veronica hederifolia L.	LC	N		RUD
Veronica montana L.	LC	N		FOR
Veronica officinalis L.	LC	N		FOR
Veronica persica Poiret	LC	N		RUD
Veronica polita Fries	VU	N	B2ab(i,iv)	RUD
Veronica praecox All.	RE	N		RUD
Veronica scutellata L.	NT	N		MAR
Veronica serpyllifolia L.	LC	N		RUD
Veronica sublobata M. Fischer	DD	N		FOR
Veronica teucrium L.	EN	N	B2ab(i,iv)	DRY
Veronica triphyllos L.	VU	N	B2ab(i,iv)	RUD
Veronica verna L.	CR	N	B2ab(i,iv)	RUD
Viburnum lantana L.	LC	N		FOR
Viburnum opulus L.	LC	N		FOR
Vicia cracca L.	LC	N		RUD
Vicia lathyroides L.	CR	N	B2ab(i,iv)	DRY
Vicia pannonica Crantz	NA	EA		RUD
Vicia pisiformis L.	RE	N		FOR
Vicia sativa L.	LC	N		RUD
Vicia sepium L.	LC	N		FOR
Vicia tenuifolia Roth	NT	N		DRY
Vicia villosa Roth	NA	EA		RUD
Vinca major L.	NA	EA		RUD

Taxon	Threat category	Status	Criteria sub-heads	Habitat type
Vinca minor L.	LC	N		FOR
Vincetoxicum hirundinaria Med.	VU	N	B2ab(i,iv)	FOR
Viola arvensis Murray	LC	N		RUD
Viola canina L.	VU	N	C2a(i)	DRY
Viola hirta L.	LC	N		FOR
Viola mirabilis L.	EN	N	B2ab(i,iv)	FOR
Viola odorata L.	LC	N		FOR
Viola palustris L.	VU	N	C2a(i)	MAR
Viola reichenbachiana Jord. ex Boreau	LC	N		FOR
Viola riviniana Reichenb.	LC	N		FOR
Viola tricolor L.	LC	N		RUD
Viscum album L.	LC	N		FOR
Vulpia bromoides (L.) S.F. Gray	EN	N	B2ab(i,iv)	DRY
Vulpia myuros (L.) C.C. Gmel.	LC	N		RUD
Vulpia unilateralis (L.) Stace	NA	EA		DRY
Wahlenbergia hederacea (L.) Reichenb.	CR	N	B2ab(i,iv)+D	MAR
Zannichellia palustris L.	VU	N	B2ab(i,iv)	AQU

Acknowledgements

A large part of the existing field data considered for the new Red List was collected by amateur and professional botanists and naturalists. Without their most valuable contribution our knowledge about the conservation status of the flora of Luxembourg would be far less documented. We thank all amateur and professional botanists for having contributed observational data of vascular plant taxa during the reference period from January 2005 onwards. We thank A. Hochkirch and S. Gaspari for useful comments on an earlier version of the manuscript and thank Armand Turpel and the SIDPNat database team of the MnhnL for maintaining the mdata.mnhn.lu web site. The wording of some sentences was improved by using ChatGPT.

Authors contributions

GC and LD established the updated checklist of vascular plants and applied the IUCN criteria to all plant taxa. For the genera *Rubus* and the pteridophytes the taxa to be included into the checklist were validated by TH and YK respectively. GC, LD, TH, YK and SSch carried out the final assessment. GC and LD did the statistical analyses of the data and wrote the text, which was commented on by the three other co-authors. The comments on pteridophytes and apomictic taxa were written by YK and TH, the section on the conservation actions by SSch.

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Appendix 1

The IUCN categories

(IUCN Standards and Petitions Committee 2024, IUCN 2012a)

Regionally Extinct (RE)

Category for a taxon when there is no reasonable doubt that the last individual potentially capable of reproduction within the region has died or has disappeared from the wild in the region, or when, if it is a former visiting taxon, the last individual has died or disappeared in the wild from the region. The setting of any time limit for listing under RE is left to the discretion of the regional Red List authority, but should not normally pre-date 1500 AD.

Critically Endangered (CR)

A taxon is Critically Endangered when the best available evidence indicates that it meets any of the criteria A to E for Critically Endangered, and it is therefore considered to be facing an extremely high risk of extinction in the wild.

Endangered (EN)

A taxon is Endangered when the best available evidence indicates that it meets any of the criteria A to E for Endangered, and it is therefore considered to be facing a very high risk of extinction in the wild.

Vulnerable (VU)

A taxon is Vulnerable when the best available evidence indicates that it meets any of the criteria A to E for Vulnerable, and it is therefore considered to be facing a high risk of extinction in the wild.

Near Threatened (NT)

A taxon is Near Threatened when it has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future.

Least Concern (LC)

A taxon is Least Concern when it has been evaluated against the criteria and does not qualify for Critically Endangered, Endangered, Vulnerable or Near Threatened. Widespread and abundant taxa are often included in this category.

Data Deficient (DD)

A taxon is Data Deficient when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. A taxon in this category may be well studied, and its biology well known, but appropriate data on abundance and/or distribution are lacking. Data Deficient is therefore not a category of threat. Listing of taxa in this category indicates that more information is required and acknowledges the possibility that future research will show that threatened classification is appropriate. It is important to make positive use of whatever data are available. In many cases great care should be exercised in choosing between DD and a threatened status. If the range of a taxon is suspected to be relatively circumscribed, or a considerable period of time has elapsed since the last record of the taxon, threatened status may well be justified.

Not Evaluated (NE)

A taxon is Not Evaluated when it has not yet been evaluated against the criteria.

The criteria for Critically Endangered, Endangered and Vulnerable taxa

(IUCN 2012b)

Critically Endangered (CR)

A taxon is Critically Endangered when the best available evidence indicates that it meets any of the following criteria (A to E), and it is therefore considered to be facing an extremely high risk of extinction in the wild:

A. Reduction in population size based on any of the following:

1. An observed, estimated, inferred or suspected population size reduction of ≥ 90 % over the last 10 years or three generations, whichever is the longer, where the causes of the reduction are clearly reversible AND understood AND ceased, based on (and specifying) any of the following:
   (a) direct observation
   (b) an index of abundance appropriate to the taxon
   (c) a decline in area of occupancy, extent of occurrence and/or quality of habitat
   (d) actual or potential levels of exploitation
   (e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites.
2. An observed, estimated, inferred or suspected population size reduction of ≥ 80 % over the last 10 years or three generations, whichever is the longer, where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of (a) to (e) under A1.
3. A population size reduction of ≥ 80 %, projected or suspected to be met within the next 10 years or three generations, whichever is the longer (up to a maximum of 100 years), based on (and specifying) any of (b) to (e) under A1.
4. An observed, estimated, inferred, projected or suspected population size reduction of ≥ 80 % over any 10 year or three generation period, whichever is longer (up to a maximum of 100 years in the future), where the time period must include both the past and the future, and where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of (a) to (e) under A1.

B. Geographic range in the form of either B1 (extent of occurrence) OR B2 (area of occupancy) OR both:

1. Extent of occurrence estimated to be less than 100 km^2, and estimates indicating at least two of a-c:
   a. Severely fragmented or known to exist at only a single location.
   b. Continuing decline, observed, inferred or projected, in any of the following:
      (i) extent of occurrence
      (ii) area of occupancy
      (iii) area, extent and/or quality of habitat
      (iv) number of locations or subpopulations
      (v) number of mature individuals.
   c. Extreme fluctuations in any of the following:
      (i) extent of occurrence
      (ii) area of occupancy
      (iii) number of locations or subpopulations
      (iv) number of mature individuals.
2. Area of occupancy estimated to be less than 10 km^2, and estimate indicating at least two of a-c:
   a. Severely fragmented or known to exist at only a single location.
   b. Continuing decline, observed, inferred or projected, in any of the following:
      (i) extent of occurrence
      (ii) area of occupancy
      (iii) area, extent and/or quality of habitat
      (iv) number of locations or subpopulations
      (v) number of mature individuals.
   c. Extreme fluctuations in any of the following:
      (i) extent of occurrence
      (ii) area of occupancy
      (iii) number of locations or subpopulations
      (iv) number of mature individuals.

C. Population size estimated to number fewer than 250 mature individuals and either:

1. An estimated continuing decline of at least 25 % within three years or one generation, whichever is longer, (up to a maximum of 100 years in the future) OR
2. A continuing decline, observed, projected, or inferred, in numbers of mature individuals AND at least one of the following (a-b):
   a. Population structure in the form of one of the following:

(i) no subpopulation estimated to contain more than 50 mature individuals, OR

(ii) at least 90 % of mature individuals in one subpopulation.

b. Extreme fluctuations in number of mature individuals.

D. Population size estimated to number fewer than 50 mature individuals.

E. Quantitative analysis showing the probability of extinction in the wild is at least 50 % within 10 years or three generations, whichever is the longer (up to a maximum of 100 years).

Endangered (EN)

A taxon is Endangered when the best available evidence indicates that it meets any of the following criteria (A to E), and it is therefore considered to be facing a very high risk of extinction in the wild:

A. Reduction in population size based on any of the following:

1. An observed, estimated, inferred or suspected population size reduction of ≥ 70 % over the last 10 years or three generations, whichever is the longer, where the causes of the reduction are clearly reversible AND understood AND ceased, based on (and specifying) any of the following:
   (a) direct observation
   (b) an index of abundance appropriate to the taxon
   (c) a decline in area of occupancy, extent of occurrence and/or quality of habitat
   (d) actual or potential levels of exploitation
   (e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites.
2. An observed, estimated, inferred or suspected population size reduction of ≥ 50 % over the last 10 years or three generations, whichever is the longer, where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of (a) to (e) under A1.
3. A population size reduction of ≥ 50 %, projected or suspected to be met within the next 10 years or three generations, whichever is the longer (up to a maximum of 100 years), based on (and specifying) any of (b) to (e) under A1.
4. An observed, estimated, inferred, projected or suspected population size reduction of ≥ 50 % over any 10 year or three generation period, whichever is longer (up to a maximum of 100 years in the future), where the time period must include both the past and the future, AND where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of (a) to (e) under A1.

B. Geographic range in the form of either B1 (extent of occurrence) OR B2 (area of occupancy) OR both:

1. Extent of occurrence estimated to be less than 5,000 km^2, and estimates indicating at least two of a-c:
   a. Severely fragmented or known to exist at no more than five locations.
   b. Continuing decline, observed, inferred or projected, in any of the following:
      (i) extent of occurrence
      (ii) area of occupancy
      (iii) area, extent and/or quality of habitat
      (iv) number of locations or subpopulations
      (v) number of mature individuals.
   c. Extreme fluctuations in any of the following:
      (i) extent of occurrence
      (ii) area of occupancy
      (iii) number of locations or subpopulations
      (iv) number of mature individuals.
2. Area of occupancy estimated to be less than 500 km^2, and estimates indicating at least two of a-c:
   a. Severely fragmented or known to exist at no more than five locations.
   b. Continuing decline, observed, inferred or projected, in any of the following:
      (i) extent of occurrence

(ii) area of occupancy
(iii) area, extent and/or quality of habitat
(iv) number of locations or subpopulations
(v) number of mature individuals.

c. Extreme fluctuations in any of the following:
(i) extent of occurrence
(ii) area of occupancy
(iii) number of locations or subpopulations
(iv) number of mature individuals.

C. Population size estimated to number fewer than 2,500 mature individuals and either:

1. An estimated continuing decline of at least 20 % within five years or two generations, whichever is longer, (up to a maximum of 100 years in the future) OR
2. A continuing decline, observed, projected, or inferred, in numbers of mature individuals AND at least one of the following (a-b):
a. Population structure in the form of one of the following:
(i) no subpopulation estimated to contain more than 250 mature individuals, OR
(ii) at least 95 % of mature individuals in one subpopulation.
b. Extreme fluctuations in number of mature individuals.

D. Population size estimated to number fewer than 250 mature individuals.

E. Quantitative analysis showing the probability of extinction in the wild is at least 20 % within 20 years or five generations, whichever is the longer (up to a maximum of 100 years).

Vulnerable (VU)

A taxon is Vulnerable when the best available evidence indicates that it meets any of the following criteria (A to E), and it is therefore considered to be facing a high risk of extinction in the wild:

A. Reduction in population size based on any of the following:

1. An observed, estimated, inferred or suspected population size reduction of ≥ 50 % over the last 10 years or three generations, whichever is the longer, where the causes of the reduction are clearly reversible AND understood AND ceased, based on (and specifying) any of the following:
(a) direct observation
(b) an index of abundance appropriate to the taxon
(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat
(d) actual or potential levels of exploitation
(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites.
2. An observed, estimated, inferred or suspected population size reduction of ≥ 30 % over the last 10 years or three generations, whichever is the longer, where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of (a) to (e) under A1.
3. A population size reduction of ≥ 30 % projected or suspected to be met within the next 10 years or three generations, whichever is the longer (up to a maximum of 100 years), based on (and specifying) any of (b) to (e) under A1.
4. An observed, estimated, inferred, projected or suspected population size reduction of ≥ 30 % over any 10 year or three generation period, whichever is longer (up to a maximum of 100 years in the future), where the time period must include both the past and the future, AND where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of (a) to (e) under A1.

B. Geographic range in the form of either B1 (extent of occurrence) OR B2 (area of occupancy) OR both:

1. Extent of occurrence estimated to be less than 20,000 km^2, and estimates indicating at least two of a-c:
a. Severely fragmented or known to exist at no more than 10 locations.

b. Continuing decline, observed, inferred or projected, in any of the following:
   (i) extent of occurrence
   (ii) area of occupancy
   (iii) area, extent and/or quality of habitat
   (iv) number of locations or subpopulations
   (v) number of mature individuals.

c. Extreme fluctuations in any of the following:
   (i) extent of occurrence
   (ii) area of occupancy
   (iii) number of locations or subpopulations
   (iv) number of mature individuals.

2. Area of occupancy estimated to be less than 2,000 km^2, and estimates indicating at least two of a-c:
   a. Severely fragmented or known to exist at no more than 10 locations.
   b. Continuing decline, observed, inferred or projected, in any of the following:
      (i) extent of occurrence
      (ii) area of occupancy
      (iii) area, extent and/or quality of habitat
      (iv) number of locations or subpopulations
      (v) number of mature individuals.
   c. Extreme fluctuations in any of the following:
      (i) extent of occurrence
      (ii) area of occupancy
      (iii) number of locations or subpopulations
      (iv) number of mature individuals.

C. Population size estimated to number fewer than 10,000 mature individuals and either:
   1. An estimated continuing decline of at least 10 % within 10 years or three generations, whichever is longer, (up to a maximum of 100 years in the future) OR
   2. A continuing decline, observed, projected, or inferred, in numbers of mature individuals AND at least one of the following (a-b):
      a. Population structure in the form of one of the following:
         (i) no subpopulation estimated to contain more than 1,000 mature individuals, OR
         (ii) all mature individuals in one subpopulation.
      b. Extreme fluctuations in number of mature individuals.

D. Population very small or restricted in the form of either of the following:
   1. Population size estimated to number fewer than 1,000 mature individuals.
   2. Population with a very restricted area of occupancy (typically less than 20 km^2) or number of locations (typically five or fewer) such that it is prone to the effects of human activities or stochastic events within a very short time period in an uncertain future, and is thus capable of becoming Critically Endangered or even Extinct in a very short time period.

E. Quantitative analysis showing the probability of extinction in the wild is at least 10 % within 100 years.

Appendix 2

Tab. A1: Proportions (and numbers) of plant taxa per habitat type for each threat category in the 2005 Red List. The proportions and numbers per habitat type for EA taxa and the proportion of taxa that are EA in each habitat type are also indicated. For habitat abbreviations see Tab. 1. RE = Regionally Extinct, CR = Critically Endangered, EN = Endangered, VU = Vulnerable, R = Extremely Rare, NT = Near Threatened, LC = Least Concern, DD = Data Deficient, NE = Not Evaluated, EA = Established Aliens. The two highest proportions per column are highlighted in bold.

	RE	CR	EN	VU	R	NT	LC	DD	NE	Total natives	EA	Total with EA	EA/Total with EA
AQU	4.5 %	2.7 %	5.1 %	8.3 %	11.6 %	0.0 %	2.9 %	0.0 %	0.0 %	3.9 %	5.9 %	4.1 %	
	(4)	(3)	(6)	(9)	(8)	(0)	(17)	(0)	(0)	(47)	(7)	(54)	**13.0 %**
DRY	**23.9 %**	**30.1 %**	**30.5 %**	**24.8 %**	13.0 %	**19.4 %**	14.0 %	0.0 %	0.0 %	17.9 %	3.4 %	16.6 %	
	(21)	(34)	(36)	(27)	(9)	(7)	(82)	(0)	(0)	(216)	(4)	(220)	1.8 %
FOR	8.0 %	9.7 %	11.0 %	**25.7 %**	**37.7 %**	**38.9 %**	**32.0 %**	0.0 %	**63.5** %	**28.2 %**	**14.4 %**	**27.0 %**	
	(7)	(11)	(13)	(28)	(26)	(14)	(187)	(0)	(54)	(340)	(17)	(357)	4.8 %
FRE	11.4 %	8.8 %	8.5 %	7.3 %	11.6 %	0.0 %	3.8 %	0.0 %	0.0 %	5.6 %	7.6 %	5.8 %	
	(10)	(10)	(10)	(8)	(8)	(0)	(22)	(0)	(0)	(68)	(9)	(77)	11.7 %
GRA	1.1 %	0.0 %	0.0 %	0.9 %	0.0 %	0.0 %	7.2 %	0.0 %	**21.2** %	5.1 %	2.5 %	4.9 %	
	(1)	(0)	(0)	(1)	(0)	(0)	(42)	(0)	(18)	(62)	(3)	(65)	4.6 %
MAR	11.4 %	22.1 %	14.4 %	18.3 %	4.3 %	11.1 %	11.8 %	0.0 %	2.4 %	12.4 %	1.7 %	11.5 %	
	(10)	25	17	20	3	4	69	0	2	150	2	152	1.3 %
ROC	5.7 %	2.7 %	6.8 %	6.4 %	**18.8 %**	13.9 %	6.0 %	**50.0** %	12.9 %	7.3 %	9.3 %	7.5 %	
	(5)	(3)	(8)	(7)	(13)	(5)	(35)	(1)	(11)	(88)	(11)	(99)	11.1 %
RUD	**34.1 %**	**23.9 %**	**23.7 %**	8.3 %	2.9 %	16.7 %	**22.4 %**	**50.0** %	0.0 %	**19.4 %**	**55.1 %**	**22.6 %**	
	(30)	(27)	(28)	(9)	(2)	(6)	(131)	(1)	(0)	(234)	(65)	(299)	**21.7 %**
Total	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	
	(88)	(113)	(118)	(109)	(69)	(36)	(585)	(2)	(85)	(1,205)	(118)	(1,323)	8.9 %

Tab. A2: Binary logistic regression analysis of the probability that a plant taxon new for Luxembourg from a certain habitat is an EA in relation to the year of its first record. The MAR habitat was used as reference (Intercept) in the regression. * = $P < 0.05$, ** = $P < 0.01$, *** = $P < 0.001$, ns = not significant. For habitat abbreviations see Tab. 1.

	Estimate	Std. Error	z-value	Pr (>|z|)
Intercept	-35.90	4.20	-8.548	< 0.001***
First record	0.02	0.002	7.691	< 0.001***
RUD	3.48	0.73	4.79	< 0.001***
AQU	2.14	0.82	2.610	0.009**
DRY	0.21	0.92	0.230	0.818 ns
FOR	1.90	0.74	2.573	0.010*
FRE	1.99	0.84	2.383	0.017*
GRA	0.77	1.02	0.762	0.446 ns
ROC	2.22	0.79	2.800	0.005**

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LISTE DES NUMÉROS PARUS À CETTE DATE

Travaux scientifiques du Musée national d'histoire naturelle (1981-1999)

I Atlas provisoire des Insectes du Grand-Duché de Luxembourg. Lepidoptera. 1ère partie (Rhopalocera, Hesperiidae). Marc Meyer et Alphonse Pelles, 1981.

II Nouvelles études paléontologiques et biostratigraphiques sur les Ammonites du Grand-Duché de Luxembourg, de la Province du Luxembourg et de la région Lorraine attenante. Pierre L. Maubeuge, 1984.

III Revision of the recent Western Europe species of genus *Potamocypris* (Crustacea, Ostracoda). Part 1: Species with short swimming setae on the second antennae. Claude Meisch, 1984.

IV-1 Hétéroptères du Grand-Duché de Luxembourg: *Psallus* (*Hylopsallus*) *pseudoplatani* n. sp. (Miridae, Phylinae) et espèces apparentées. Léopold Reichling, 1984.

IV-2 Hétéroptères du Grand-Duché de Luxembourg: Quelques espèces peu connues, rares ou inattendues. Léopold Reichling, 1985.

V La bryoflore du Grand-Duché de Luxembourg: taxons nouveaux, rares ou méconnus. Ph. De Zuttere, J. Werner et R. Schumacker, 1985.

VI Revision of the recent Western Europe species of genus *Potamocypris* (Crustacea, Ostracoda). Part 2: Species with long swimming setae on the second antennae. Claude Meisch, 1985.

VII Les Bryozoaires du Grand-Duché de Luxembourg et des régions limitrophes. Gaby Geimer et Jos. Massard, 1986.

VIII Répartition et écologie des macrolichens épiphytiques dans le Grand-Duché de Luxembourg. Elisabeth Wagner-Schaber, 1987.

IX La limite nord-orientale de l'aire de *Conopodium majus* (Gouan) Loret en Europe occidentale. Régine Fabri, 1987.

X Epifaune et endofaune de *Liogryphaea arcuata* (Lamarck). Contribution à l'écologie des populations de *Liogryphaea arcuata* (Lamarck) dans le Sinémurien au NE du Bassin de Paris. Armand Hary, 1987.

XI Liste rouge des Bryophytes du Grand-Duché de Luxembourg. Jean Werner, 1987.

XII Relic stratified scress occurences in the Oesling (Grand-Duchy of Luxembourg), approximate age and some fabric properties. Peter A. Riezebos, 1987.

XIII Die Gastropodenfauna der "angulata-Zone" des Steinbruchs "Reckingerwald" bei Brouch. Hellmut Meier et Kurt Meiers, 1988.

XIV Les lichens épiphytiques et leurs champignons lichénicoles (macrolichens exceptés) du Luxembourg. Paul Diederich, 1989.

XV Liste annotée des Ostracodes actuels non-marins trouvés en France (Crustacea, Ostracoda). Claude Meisch, Karel Wouters et Koen Martens, 1989.

XVI Atlas des lichens épiphytiques et de leurs champignons lichénicoles (macrolichens exceptés) du Luxembourg. Paul Diederich, 1990.

XVII Beitrag zur Faunistik und Ökologie der Schmetterlinge im ehemaligen Erzabbaugebiet "Haardt" bei Düdelingen. Jos. Cungs, 1991.

XVIII Moosflora und -Vegetation der Mesobrometen über Steinmergelkeuper im Luxemburger und im Bitburger Gutland. Jean Werner, 1992.

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