

Title: **ReSurveyGermany: Vegetation-plot time-series over the past hundred years in Germany**

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- 99 Design Type(s): time series, vegetation-plot data
- 100 Measurement Type(s): biodiversity, cover of vascular plant species in vegetation-plot records
- 101 Technology Type(s): (semi-)permanent plots, resurveys
- 102 Factor Type(s): year of vegetation record, geographic location, EUNIS habitat type
- 103 Sample Characteristic(s): cover records for 1,794 vascular plant species in 7,738 (semi-)permanent
- 104 vegetation plots from Germany, resurveyed from 2 to 54 times, in total resulting in 23,641 vegetation
- 105 records and 458,311 species cover records, comprising the years from 1927 to 2020 and 97 EUNIS
- 106 habitat types
- 107

108 **Abstract**

109 Vegetation-plot resurvey data are a main source of information on terrestrial biodiversity change,

110 with records reaching back more than one century. Although more and more data from re-sampled

111 plots have been published, there is not yet a comprehensive open-access dataset available for

analysis. Here, we compiled and harmonised vegetation-plot resurvey data from Germany covering almost 100 years. We show the distribution of the plot data in space, time and across habitat types of the European Nature Information System (EUNIS). In addition, we include metadata on geographic location, plot size and vegetation structure. The data allow calculating temporal biodiversity change at the community scale and reach back further into the past than most comparable data yet available. They also enable tracking changes in the incidence and distribution of individual species across Germany. In summary, the data come at a level of detail that holds promise for broadening our understanding of the mechanisms and drivers behind plant diversity change over the last century.

Background & Summary

The current biodiversity crisis threatens an estimated one million species with extinction¹. The nature and rate of observed changes depend on the spatial scale at which they are observed². At the finest scale, i.e. the local scale of plant communities, vegetation-plot records have been found to become sometimes richer, sometimes poorer in species³, while a considerable temporal species turnover is apparent in the majority of cases⁴.

Vegetation-plot time series have mainly been collected for particular habitats, such as forests^{5–17}, hedgerows¹⁸, wet grasslands^{19–22}, mesic grasslands^{23–29}, dry grasslands^{22,30–35}, acid grasslands and heathlands^{36–38}, alpine grasslands^{39,40}, rivers⁴¹, riverbanks⁴², peatlands^{43–46}, roadsides⁴⁷ or arable land^{48–50}. Sometimes, they were recorded to assess the changes in species composition across all communities that occur in a certain area^{51–55}. So far, vegetation-plot time series have not been accessible without restrictions. In contrast, open access biodiversity time-series data such as BioTIME⁵⁶, comprise all different types of taxonomic groups, ranging from plants, plankton and terrestrial invertebrates to vertebrates, but include only a few vegetation-plot time series. Thus, our database closes a gap for a particular region, which is Germany.

Vegetation-plot resurvey data have been extensively used to assess biodiversity changes by means of monitoring certain vegetation types in local studies, such as managed grasslands²⁴ and rivers⁴¹. More recently, time series have been collected across regions, exploring the contribution of local biodiversity change³ to that observed at broader spatial scales^{1,57,58}. While these analyses often failed to detect changes in species richness^{3,59,60}, they were able to relate the observed trends to changes in land use and climate^{61,62}. Although these studies have compiled databases on vegetation-plot time series, they are currently not openly available. This is also the case for the current initiative of ReSurveyEurope, which collates and mobilizes vegetation-plot data with repeated measurements over time (<http://euroveg.org/eva-database-re-survey-europe>). Our aim is to provide a comprehensive and taxonomically standardised database of vegetation-plot time series for Germany. We confined the geographical extent to Germany because of a long tradition of German vegetation scientists carrying out temporal observations on permanent plots (e.g.²⁸), the large amount of available data, our familiarity with the regional literature, and of recent initiatives to mobilize retrospective biodiversity data for trend analyses (www.idiv.de/smon).

Vegetation-plot time series differ in some fundamental ways from other biodiversity time series. Since the advent of phytosociology in the early 20th century^{63,64}, vegetation surveys were carried out in a standardised way. Plot sizes of vegetation relevés can vary considerably and depend on the vegetation type considered (e.g. forest plots usually have plot sizes between 100 and 1000 m², while non-forest plots mostly range from 4 to 100 m²⁶⁵). In addition, sampling protocols might vary between studies, but they all include complete lists of species occurring at the plot at the time of sampling. In consequence, vegetation-plot records provide information on both presences and

absences of species in a community. As sampling is usually done by professionals, absences of a previously occurring species in a time series strongly indicates local extinction, or vice versa, the presence of a species that had not been recorded previously is a robust indication of colonization. However, even with experts carrying out the survey, it is possible that some species may remain undetected in the record because of their phenology or taxonomic uncertainties⁶⁵. Yet, such vegetation-plot data are much more reliable than vegetation surveys at larger scales, such as floristic grid mapping, where false absence data are the rule^{66,67}. In contrast to time series at broader spatial scales, vegetation-plot time series contain information on species co-occurrence at scales relevant for direct biotic interactions among individuals⁶⁸. An additional advantage of vegetation-plot records is that they report the relative abundance of species, in the case of vegetation records from Germany, typically assessed as cover values^{69,65}. Thus, vegetation-plot records allow testing key theories of biogeography, such as the abundance–range size relationship⁷⁰ or the relationship between local abundance and niche breadth^{71,72}. Most importantly, several vegetation-plot time series precede the onset of any other systematic plant species monitoring programme, such as for example the monitoring of Natura 2000 sites in Europe, which only started in 2001⁷³. This is particularly important because severe biodiversity loss may have already happened in the second half of the 20th century, mainly brought about by shifts in the type and intensity of landuse as the consequence of technical progress and societal changes⁷⁴. Finally, species-abundance data in plots can be linked to functional information on species⁶⁵, which allows the interpretation of the underlying ecological drivers of the changes observed and the consequences for ecosystem functioning⁷⁵.

Based on the data described here we analysed for the first time the dynamics of losses and gains of plant species⁷⁶. We showed that the difference in cover changes between decreasing and increasing species results in biodiversity change even if species richness at the plot scale remains unchanged. Two mechanisms are responsible for these changes. First, losses at the plot scale were more evenly distributed among losing species than gains among winning species. Second, gains and losses in cover were concentrated in different species, resulting in a higher number of losers than winners at the spatial scale of Germany. The temporal extent of the data allowed us to demonstrate that most species losses occurred already in the 1960s, affecting mostly species from mires and spring fens, grasslands and arable land. Thus, these data already helped to shed light on the most important mechanisms underlying biodiversity change in the second half of the 20th century.

Data Records

ReSurveyGermany is the most comprehensive compilation of repeated long-term vegetation plot records from Germany to date, including published studies as well as surveys from grey literature and nature conservation assessments. A list of all 92 projects included in the study is provided in Table 1. A project might comprise one or several studies and focus on one or several vegetation types, but typically carried out the surveys at the same times and with the same methodology. In total, the projects comprise 1,794 vascular plant species recorded in 7,738 vegetation plots. The plots were either marked with poles or magnets (permanent) or recovered from exact descriptions (semi-permanent). In addition, there were also studies where plots were not matched in time but a set of plots at a site was compared within another set of plots at the same site in the resurvey (community comparison, Fig. 1). We only considered records with complete lists of vascular plants and information on their relative abundance, which was mostly expressed as percentage cover⁷⁷. A further important criterion for including a study was the existence of vegetation data for at least two points in time, although the number of visits (i.e. vegetation records) per site ranged between two and 54. The time span covered by each project is shown in Fig. 1. All records were made between

1927 and 2020. In total, ReSurvey Germany comprises 23,641 vegetation-plot records and 458,311 species cover records.

Plot locations are not evenly spread across Germany (Fig. 2). We assigned the individual plot locations to the grid cells of the quadrants of German ordnance maps ("MTBQ," 0°10' × 0°6', approximately 5.6 km × 5.9 km in the centre of Germany), and tested whether the grid cells with vegetation-plot time-series records differed from those without observations with respect to population density, road density, urban cover, cropland cover and protected areas. This revealed that the sampled grid cells were not representative for the whole area of Germany. Surprisingly, the sampled grid cells showed significantly higher human population densities, road densities and urban cover, while cover of cropland and the amount of protected area was lower (Table 2), which indicates that the majority of time series was made in regions with higher human pressures. The lack of spatial representativeness also becomes obvious when plotting maps of plot locations by the decade of the times when they were visited (Fig. 3).

While we did not deliberately exclude certain habitat types, the data mainly consist of semi-natural to intensively managed grasslands and forests. Thus, the time series in ReSurveyGermany are biased with respect to habitat types. We assigned EUNIS habitat types to each plot record. This was accomplished by using the expert system EUNIS-ESy⁷⁸ and the corresponding R code⁷⁹. Plot records covered a total of 92 EUNIS habitat types out of the 150 ones distinguished for Germany. About 63% of the 23,641 plot records came from grasslands (level 1 EUNIS habitat R, n=14,849), followed by forests and other wooded lands (T, n= 5,440, 23%). In contrast, arable land (V, vegetated man-made habitats), which makes up more than 36% of the land cover in Germany, was only represented by 3% (816 plot records).

Database organisation

A separate database was created for each project that contributed data, using the data-management software Turboveg 2⁸⁰. The database is composed of two main tables, following the structure of Turboveg and common practice in vegetation science. The plot-species-abundance table contains six fields as described in Table 3. It is linked to the plot metadata (header file) through PROJECT_ID_RELEVE_NR, which is a unique Plot observation ID of a combination of PROJECT_ID (see Table 1) and the plot observation ID (called RELEVE_NR), the name of the observed taxon (TaxonName), the vertical layer (tree layer, shrub layer, herb layer, moss layer) in which the species was observed (LAYER) and the taxon's cover in the plot (Cover_Perc). The latter was obtained by transforming the original cover classes in per cent cover. For example, the seven cover classes of the Braun-Blanquet scale, r, +, 1, 2, 3, 4, 5 were transformed to 1%, 2%, 3%, 13%, 38%, 63%, 88%, respectively. The other table is the so-called header file, which holds all important plot-level information, such as plot sizes, geographic location and vegetation structure for each plot observation ID (Table 4).

The taxon names in the plot-species-abundance table were standardised using German SL 1.3⁸¹. The nomenclature for vascular plants followed Wisskirchen et al.⁸², with additional aggregations to higher taxonomic levels according to German SL 1.3. As some authors recorded subspecies and other infraspecific taxa, species were aggregated at the species level, using vegdata⁸³. Some closely related species that, from our experience, are often mistaken in the field were merged at the aggregate or genus level. Species aggregates were also used when different taxon names of the same aggregate occurred in different projects, to prevent that the same taxon might appear under different taxon names. We used our own R code to merge taxon names and the notation of the ESy expert system⁷⁸ to protocol all steps. The species harmonisation forms the first section of the ESy system and shows

which taxon names were aggregated under the name of a broader taxonomic concept (Table 5). In addition, within single projects, we used customised aggregations and segregations when the same taxa were reported with different taxonomic levels at different points in time in the same plot resurvey IDs (Table 6). For example, in all years of a time series of a specific plot *Orchis militaris* was reported but in one year *Orchis* spec. was recorded at the genus level. Unaccounted for, such a leap between taxonomic levels within a time series would result in incorrect species change observations. To avoid losing the predominating information at the species level by aggregating all records to *Orchis*, we assumed that the taxon was also *Orchis militaris* in the particular year when only the genus level was reported. If more than one taxon occurred in previous years, we equally distributed the cover values among those taxa. This happened for example when a record was taken late in spring when the two species *Anemone nemorosa* and *A. ranunculoides* could no longer be distinguished.

The percentage cover values of the same aggregated taxon name of the same plot were merged, assuming a random overlap of their cover values and making sure that the combined cover values cannot exceed 100%⁷⁸. As not all projects had recorded cryptogams, we removed bryophytes and lichens in all projects, using the vegdata package in R⁸³. As a result, the original list of 3,280 taxon names that included bryophytes and lichens was reduced to 1,794 taxon names of vascular plants. However, if data on lichens and bryophytes are required, they are available on request from the respective dataset custodians (see Table 1).

The data structure of the header file of ReSurveyGermany follows the Turboveg 2 standard⁸⁰ and in addition holds the fields of ReSurveyEurope (<http://euroveg.org/eva-database-re-survey-europe>) (Table 4). The fields relevant for the resurvey are RS_PROJECT, which refers to the resurvey project in Table 1. The header field RS_SITE holds the location name of plots and allows for a local geographical scale aggregation of resurvey plots within projects. LOCALITY provides more details on the locality in German

Within each project, the field RS_PLOT holds a plot resurvey ID that connects plot observations from different times made on the same plot. In resurveys, there are also cases, where the previously provided location was not precise enough. In these cases, resurveys often used several plots to match one previous plot, resulting in a one-to-many relationship. If a set of plots at the same site was compared with plot records from another point in time, this field is empty and the unique identifier indicating which plots have to be matched is found in the field RS_SITE. We still keep the original observation ID that a plot received when it was surveyed (RS_OBSERV). We report the exact DATE when a record was made (if available). In addition, the field YEAR lists the year in which the plot was (re)surveyed. If available, we also report the year of the underlying publication (YEAR_PUBL).

Plot area (SURF_AREA) ranges from 0.5 to 2500 m², with 25, 100 and 400 m² being the most frequently used plot sizes (Fig. 4). Plot sizes larger than 100 m² were typical of forest sites (with a very few exceptions).

Geographic information is given by LONGITUDE, LATITUDE and ALTITUDE. Current monitoring programs and data protection of land owners do not allow us to provide location information at the highest available precision. In addition, some records contain occurrence data of rare and protected species. Thus, information on longitude and latitude was rounded to two decimal digits. Compared to the coordinates at highest available precision, rounding resulted in a mean uncertainty of 371 m ($\pm$ 138 m standard deviation), and thus, is within the somewhat limited range of accuracy provided by many custodians in the first place (see field PRECISION). If more precise coordinates are required for certain analysis we recommend to contact the respective data owners (as shown in Table 1).

Vegetation-plot time series differ with respect to the accuracy of the plot relocation during the

resurvey. In the ideal case, plots are permanently marked, using poles, metal tent pegs or magnets and metal detectors to retrieve their position (shown as “01” in the LOC_METHOD field, Table 4). In other cases, plots only have exact coordinates (using GPS coordinates, “03” or “04”) or other ways of descriptions of the exact locality (such as from maps, “05”), but are not marked on the ground, which we refer to as semi-permanent plots. In addition, there is information on the cover scale used for the record, a reference to the data source (or, if published, the publication ID), including the table and column from which the data were taken.

The orientation of the plot can be taken from SLOPE (inclination) and slope ASPECT (compass directions). Vegetation structure is described by the height and cover of the different layers, ranging from tree layer to moss layer and including information on cover of litter and bare soil (if available).

Some of our projects included experimental treatments with different management of habitats (e.g. abandonment or establishment of grazing, succession and disturbance). Plots with experimental manipulation contain “Y” in the MANIPULATE field. The type of manipulation can be taken from MANIPTYPE. When projects involved treatments that are not representative for biodiversity change in the study, we included only the control plots⁴⁴, plots that reflected the predominant land use at the site (e.g. mowing for a grassland to counteract natural succession)²⁰, that were unfenced⁸⁴ or were subjected to continuous grazing⁸⁵.

Usage notes

The data of the ReSurveyGermany dataset as described above is available <https://doi.org/10.25829/ivid.3508-c17blk> under the terms specified by CC BY 4.0.

[Please note that the link is not yet activated, which will happen around May 25th, 2022. In the meantime you can already access the metadata via

<https://idata.idiv.de/ddm/Data/ShowData/3508?version=0> and the full dataset here: <https://cloud.uni-halle.de/s/wei1ljnq2Wet0A>

This part marked in yellow will then be deleted from the paper]

Users are urged to cite the original sources when using ReSurveyGermany in addition to the present paper (see Table 1). As some of the time series will be continued, it might be useful to contact the respective data owners. As described above, the dataset cannot be considered representative of Germany’s vegetation, neither spatially, nor temporally, which is typical of vegetation-plot time series⁸⁶. As plots were established with different objectives in different habitats at different points in time, analysis of vegetation-plot resurveys faces various methodological challenges⁶⁰. Yet, we note that ReSurveyGermany covers about 60% of the 2,988 vascular plant species that occur in Germany (without subspecies and segregates⁸²) and includes rare habitats which often harbour rare plant species. This means that even if our sites are not fully representative of the vegetation of Germany and its change over the last century, the data nevertheless give important insights into biodiversity change at the level of local communities and individual species.

Code availability

The R code to read the plot-species-abundance file (ReSurveyGermany.csv) and combine it with the header data (Header_ReSurveyGermany.csv) is provided on https://github.com/ivid-biodiversity/Read_ReSurveyGermany.

Acknowledgments

We are grateful to surveyors who recorded vegetation in the field and provided these data. We acknowledge those data contributors who made their data available to us or helped in recording these data: Thea Dittmann, Alexandra Erfmeier, Bernd Gerken, Kerstin Günther, Sabine Heinz, Wilfried Hakes, Heike Heklau, Alfons Henrichfreise, Elisabeth Hüllbusch, Andreas Huwer, Anneke Immoor, Sophie Luise Kühn, Benjamin Krause, Sebastian Leonhardt, Thomas Meineke, Jutta Rach, Jennifer Reinecke, Ulrich Scheidel and Immo Vollmer. We thank Diana Bowler for her analysis of spatial representativeness. The assistance of the iDiv Data & Code Unit (Anahita Kazem, Ludmilla Figueiredo) for archiving the dataset is greatly acknowledged. We very much appreciate the support for the strategic project sMon by the German Centre for Integrative Biodiversity Research (iDiv) Halle-Jena-Leipzig, funded by the German Research Foundation (DFG-FZT 118, 202548816).

References

1. Díaz, S. *et al.* Pervasive human-driven decline of life on Earth points to the need for transformative change. *Science* **366**, eaax3100 (2019).
2. Chase, J. M. *et al.* Species richness change across spatial scales. *Oikos* **128**, 1079–1091 (2019).
3. Vellend, M. *et al.* Global meta-analysis reveals no net change in local-scale plant biodiversity over time. *Proceedings of the National Academy of Sciences* **110**, 19456–19459 (2013).
4. Blowes, S. A. *et al.* The geography of biodiversity change in marine and terrestrial assemblages. *Science* **366**, 339–345 (2019).
5. Bernhardt-Römermann, M. *et al.* Drivers of temporal changes in temperate forest plant diversity vary across spatial scales. *Glob Change Biol* **21**, 3726–3737 (2015).
6. Ahrns, C. & Hofmann, G. Vegetationsdynamik und Florenwandel im ehemaligen mitteldeutschen Waldschutzgebiet ‘Hainich’ im Intervall 1963 - 1995. *Hercynia N.F* **31**, 33–64 (1998).
7. Dittmann, T., Heinken, T. & Schmidt, M. Die Wälder von Magdeburgerforst (Fläming, Sachsen-Anhalt) – eine Wiederholungsuntersuchung nach sechs Jahrzehnten. (2018)
doi:10.14471/2018.38.009.
8. Günther, K., Schmidt, M., Quitt, H. & Heinken, T. Veränderungen der Waldvegetation im Elbe-Havelwinkel von 1960 bis 2015. *Tuexenia* **41**, 53–85 (2021).

9. Janiesch, P. Vegetationsökologische Untersuchungen in einem Erlenbruchwald im nördlichen Münsterland. 25 Jahre im Vergleich. *Abhandlungen aus dem Westfälischen Museum für Naturkunde* 71–80 (2003).
10. Naaf, T. & Wulf, M. Habitat specialists and generalists drive homogenization and differentiation of temperate forest plant communities at the regional scale. *Biological Conservation* **143**, 848–855 (2010).
11. Reinecke, J., Klemm, G. & Heinken, T. Vegetation change and homogenization of species composition in temperate nutrient deficient Scots pine forests after 45 yr. *J Veg Sci* **25**, 113–121 (2014).
12. Mölder, A., Streit, M. & Schmidt, W. When beech strikes back: How strict nature conservation reduces herb-layer diversity and productivity in Central European deciduous forests. *Forest Ecology and Management* **319**, 51–61 (2014).
13. Fischer, C., Parth, A. & Schmidt, W. Vegetationsdynamik in Buchen-Naturwäldern. Ein Vergleich aus Süd-Niedersachsen. *Hercynia N.F.* 45–68 (2009).
14. Schmidt, W. Die Naturschutzgebiete Hainholz und Staufenberg am Harzrand - Sukzessionsforschung in Buchenwäldern ohne Bewirtschaftung (Exkursion E). *Tuexenia* **22**, 151–213 (2002).
15. Strubelt, I., Diekmann, M. & Zacharias, D. Changes in species composition and richness in an alluvial hardwood forest over 52 yrs. *J Veg Sci* **28**, 401–412 (2017).
16. Strubelt, I., Diekmann, M., Peppler-Lisbach, C., Gerken, A. & Zacharias, D. Vegetation changes in the Hasbruch forest nature reserve (NW Germany) depend on management and habitat type. *Forest Ecology and Management* **444**, 78–88 (2019).
17. Wilmanns, O. & Bogenrieder, A. Veränderungen der Buchenwälder des Kaiserstuhls im Laufe von vier Jahrzehnten und ihre Interpretation - pflanzensoziologische Tabellen als Dokumente. *Abh. Landesmus. Naturk. Münster Westfalen* **48**, 55–79 (1986).
18. Huwer, A. & Wittig, R. Changes in the species composition of hedgerows in the Westphalian Basin over a thirty-five-year period. *Tuexenia* **32**, 31–53 (2012).

19. Immoor, A., Zacharias, D., Müller, J. & Diekmann, M. A re-visitation study (1948–2015) of wet grassland vegetation in the Stedinger Land near Bremen, North-western Germany. (2017) doi:10.14471/2017.37.013.
20. Rosenthal, G. Erhaltung und Regeneration von Feuchtwiesen. Vegetationsökologische Untersuchungen auf Dauerflächen. *Diss. Bot.* **182**, 1–283 (1992).
21. Poptcheva, K., Schwartz, P., Vogel, A., Kleinebecker, T. & Hölzel, N. Changes in wet meadow vegetation after 20 years of different management in a field experiment (North-West Germany). *Agriculture, Ecosystems & Environment* **134**, 108–114 (2009).
22. Diekmann, M. *et al.* Patterns of long-term vegetation change vary between different types of semi-natural grasslands in Western and Central Europe. *J Veg Sci* **30**, 187–202 (2019).
23. Hundt, R. *Ökologisch-geobotanische Untersuchungen an den mitteldeutschen Wiesengesellschaften unter besonderer Berücksichtigung ihres Wasserhaushaltes und ihrer Veränderung durch die Intensivbewirtschaftung.* (Wehry-Druck OHG, 2001).
24. Kuhn, G., Heinz, S. & Mayer, F. Grünlandmonitoring Bayern. Ersterhebung der Vegetation 2002 - 2008. *Schriftenreihe LfL Bayerische Landesanstalt für Landwirtschaft* **3**, 1–161 (2011).
25. Raehse, S. *Veränderungen der hessischen Grünlandvegetation seit Beginn der 50er Jahre am Beispiel ausgewählter Tal- und Bergregionen Nord- und Mittelhessens.* (University Press GmbH, 2001).
26. Scheidel, U. & Bruehlheide, H. Versuche zur Beweidung von Bergwiesen im Harz. *Hercynia N.F.* **37**, 87–101 (2004).
27. Sommer, S. & Hachmöller, B. Auswertung der Vegetationsaufnahmen von Dauerbeobachtungsflächen auf Bergwiesen im NSG Oelsen bei variierter Mahd im Vergleich zur Brache. *Ber. Arbeitsgem. Sächs. Bot. N.F.* **18**, 99–135 (2001).
28. Wegener, U. Vegetationswandel des Berggrünlands nach Untersuchungen von 1954 bis 2016 - Wege zur Erhaltung der Bergwiesen. Mountain grasslands vegetation change after research from 1954 to 2016 - ways to preserve mountain meadows. *Abhandlungen und Berichte aus dem Museum Heineanum* **11**, 35–101 (2018).

29. Wittig, B., Müller, J. & Mahnke-Ritoff, A. Talauen-Glatthaferwiesen im Verdener Wesertal (Niedersachsen). *Tuexenia* **39**, 249–265 (2019).
30. Heinrich, W., Marstaller, R. & Voigt, W. Eine Langzeitstudie zur Sukzession in Halbtrockenrasen – Strukturwandlungen in einer Dauerbeobachtungsfläche im Naturschutzgebiet „Leutratal und Cospoth“ bei Jena (Thüringen). *Artenschutzreport Jena* **30**, 1–80 (2012).
31. Hüllbusch, E., Brand, L. M., Ende, P. & Dengler, J. Little vegetation change during two decades in a dry grassland complex in the Biosphere Reserve Schorfheide-Chorin (NE Germany). *Tuexenia* **36**, 395–412 (2016).
32. Knapp, R. Dauerflächen-Untersuchungen über die Einwirkung von Haustieren und Wild während trockener und feuchter Zeiten in Mesobromion-Halbtrockenrasen in Hessen. *Mitt. Florist.-Soziol. Arbeitsgem. N.F.* **19/20**, 269–274 (1977).
33. Matesanz, S., Brooker, R. W., Valladares, F. & Klotz, S. Temporal dynamics of marginal steppic vegetation over a 26-year period of substantial environmental change: Temporal dynamics of marginal steppic vegetation over a 26-year period. *Journal of Vegetation Science* **20**, 299–310 (2009).
34. Schwabe, A., Zehm, A., Nobis, M., Storm, C. & Süß, K. Auswirkungen von Schaf-Erstbeweidung auf die Vegetation primär basenreicher Sand-Ökosysteme. *NNA Berichte* **1/2004**, 39–54 (2004).
35. Schwabe, A., Süß, K. & Storm, C. What are the long-term effects of livestock grazing in steppic sandy grassland with high conservation value? Results from a 12-year field study. *Tuexenia* **33**, 189–212 (2013).
36. Peppler-Lisbach, C., Stanik, N., Könitz, N. & Rosenthal, G. Long-term vegetation changes in *Nardus* grasslands indicate eutrophication, recovery from acidification, and management change as the main drivers. *Appl Veg Sci* **23**, 508–521 (2020).
37. Peppler-Lisbach, C. & Könitz, N. Vegetationsveränderungen in Borstgrasrasen des Werra-Meißner-Gebietes (Hessen, Niedersachsen) nach 25 Jahren. *Tuexenia* **37**, 201–228 (2017).

38. Wittig, B., Müller, J., Quast, R. & Miehlisch, H. *Arnica montana* in Calluna-Heiden auf dem Schießplatz Unterlüß (Niedersachsen). *Tuexenia* **40**, 131–146 (2020).
39. Rumpf, S. B. *et al.* Range dynamics of mountain plants decrease with elevation. *Proc Natl Acad Sci USA* **115**, 1848–1853 (2018).
40. Kudernatsch, T. *et al.* Vegetationsveränderungen alpiner Kalk-Magerrasen im Nationalpark Berchtesgaden während der letzten drei Jahrzehnte. *Tuexenia* **36**, 205–221 (2016).
41. Poschlod, P. *et al.* Long-term monitoring in rivers of south Germany since the 1970ies. Macrophytes as indicators for the assessment of water quality. in *Long-term ecological research. Between Theory and Application* (eds. Müller, F., Baessler, C., Schubert, H. & Klotz, S.) 189–199 (Springer, 2006).
42. Dierschke, H. Dynamik und Konstanz an naturnahen Flussumfern. 27 Jahre Dauerflächenuntersuchungen am Oderufer (Harzvorland). *Braunschweiger Geobotanische Arbeiten* **9**, 119–138 (2008).
43. Kreyling, J. *et al.* Rewetting does not return drained fen peatlands to their old selves. *Nat Commun* **12**, 5693 (2021).
44. Bohn, U. & Schniotalle, S. *Hochmoor-, Grünland- und Waldrenaturierung im Naturschutzgebiet 'Rotes Moor'/Hohe Rhön 1981-2001*. (Landwirtschaftsverlag, 2008).
45. Koch, M. & Jurasinski, G. Four decades of vegetation development in a percolation mire complex following intensive drainage and abandonment. *Plant Ecology & Diversity* **8**, 49–60 (2015).
46. Walther, K. Die Vegetation des Maujahn 1984. Wiederholung der vegetationskundlichen Untersuchung eines wendländischen Moores. *Tuexenia* **6**, 145–193 (1986).
47. Berg, C. & Mahn, E.-G. Anthropogene Vegetationsveränderungen der Straßenrandvegetation in den letzten 30 Jahren - die Glatthaferwiesen des Raumes Halle/Saale. *Tuexenia* **10**, 185–195 (1990).

48. Meyer, S., Wesche, K., Krause, B. & Leuschner, C. Dramatic losses of specialist arable plants in Central Germany since the 1950s/60s - a cross-regional analysis. *Diversity Distribution* **19**, 1175–1187 (2013).
49. Meyer, S., Wesche, K., Krause, B. & Leuschner, C. Veränderungen in der Segetalflora in den letzten Jahrzehnten und mögliche Konsequenzen für Agrarvögel. *Julius-Kühn-Archiv* **442**, 64–78 (2013).
50. Kutzelnigg, H. Veränderungen der Ackerwildkrautflora im Gebiet um Moers/Niederrhein seit 1950 und ihre Ursachen. *Tuexenia* **4**, 81–102 (1984).
51. Milligan, G., Rose, R. J. & Marrs, R. H. Winners and losers in a long-term study of vegetation change at Moor House NNR: Effects of sheep-grazing and its removal on British upland vegetation. *Ecological Indicators* **68**, 89–101 (2016).
52. Wittig, B., Waldman, T. & Diekmann, M. Veränderungen der Grünlandvegetation im Holtumer Moor über vier Jahrzehnte. *Hercynia N.F* **40**, 285–300 (2007).
53. Henning, K., Lorenz, A., von Oheimb, G., Härdtle, W. & Tischew, S. Year-round cattle and horse grazing supports the restoration of abandoned, dry sandy grassland and heathland communities by suppressing *Calamagrostis epigejos* and enhancing species richness. *Journal for Nature Conservation* **40**, 120–130 (2017).
54. Blüml, V. Langfristige Veränderungen von Flora und Vegetation des Grünlandes in der Dümmerniederung (Niedersachsen) unter dem Einfluss von Naturschutzmaßnahmen. (Bremen, 2011).
55. Von Oheimb, G. et al. *Halboffene Weidelandschaft Höltingbaum. Perspektiven für den Erhalt und die naturverträgliche Nutzung von Offenlandlebensräumen*. (Landwirtschaftsverlag, 2006).
56. Dornelas, M. et al. BioTIME: A database of biodiversity time series for the Anthropocene. *Global Ecol Biogeogr* **27**, 760–786 (2018).
57. Pimm, S. L. et al. The biodiversity of species and their rates of extinction, distribution, and protection. *Science* **344**, 1246752–1246752 (2014).

- 502 58. Barnosky, A. D. *et al.* Has the Earth's sixth mass extinction already arrived? *Nature* **471**, 51–
503 57 (2011).
- 504 59. Vellend, M. The Biodiversity Conservation Paradox. *Am. Sci.* **105**, 94 (2017).
- 505 60. Cardinale, B. J., Gonzalez, A., Allington, G. R. H. & Loreau, M. Is local biodiversity declining or
506 not? A summary of the debate over analysis of species richness time trends. *Biological*
507 *Conservation* **219**, 175–183 (2018).
- 508 61. Perring, M. P. *et al.* Understanding context dependency in the response of forest understorey
509 plant communities to nitrogen deposition. *Environmental Pollution* **242**, 1787–1799 (2018).
- 510 62. Steinbauer, M. J. *et al.* Accelerated increase in plant species richness on mountain summits is
511 linked to warming. *Nature* **556**, 231–234 (2018).
- 512 63. Braun-Blanquet, J. Prinzipien einer Systematik der Pflanzengesellschaften auf floristischer
513 Grundlage. *Jahrb. St. Gallischen Naturwiss. Ges.* **57**, 305–351 (1921).
- 514 64. Becking, R. W. The Zürich-Montpellier school of phytosociology. *Bot. Rev.* **23**, 411–488
515 (1957).
- 516 65. Brulheide, H. *et al.* sPlot – A new tool for global vegetation analyses. *J Veg Sci* **30**, 161–186
517 (2019).
- 518 66. O L Pescott, T A Humphrey & K J Walker. A short guide to using British and Irish plant
519 occurrence data for research. (2018) doi:10.13140/RG.2.2.33746.86720.
- 520 67. Eichenberg, D. *et al.* Widespread decline in Central European plant diversity across six
521 decades. *Global Change Biology* **27**, 1097–1110 (2021).
- 522 68. Chytrý, M. *et al.* European Vegetation Archive (EVA): an integrated database of European
523 vegetation plots. *Appl Veg Sci* **19**, 173–180 (2016).
- 524 69. Van der Maarel, E. Transformation of cover-abundance values in phytosociology and its
525 effects on community similarity. *Vegetatio* **39**, 97–114 (1979).
- 526 70. Gaston, K. J. & Curnutt, J. L. The dynamics of abundance-range size relationships. *Oikos* **81**, 38
527 (1998).
- 528 71. Gaston, K. J. *et al.* Abundance-occupancy relationships. *J Appl Ecology* **37**, 39–59 (2000).

72. Sporbert, M. *et al.* Testing macroecological abundance patterns: The relationship between local abundance and range size, range position and climatic suitability among European vascular plants. *J Biogeogr* jbi.13926 (2020) doi:10.1111/jbi.13926.
73. European Commission. *Report on the Conservation Status of Habitat Types and Species as required under Article 17 of the Habitats Directive*. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52009DC0358> (2009).
74. Poschlod, P. *Geschichte der Kulturlandschaft*. (Ulmer, 2017).
75. McGill, B., Enquist, B., Weiher, E. & Westoby, M. Rebuilding community ecology from functional traits. *Trends in Ecology & Evolution* **21**, 178–185 (2006).
76. Jandt, U., Bruehlheide, H. & ReSurveyGermany Consortium. Plant diversity change over the past hundred years in Germany: more losers than winners. *Nature* **(under revision)**, (2022).
77. Schaminée, J. H. J., Hennekens, S. M., Chytrý, M. & Rodwell, J. S. Vegetation-plot data and databases in Europe: an overview. *Preslia* **81**, 173–185 (2009).
78. Chytrý, M. *et al.* EUNIS Habitat Classification: Expert system, characteristic species combinations and distribution maps of European habitats. *Appl Veg Sci* **23**, 648–675 (2020).
79. Bruehlheide, H., Tichý, L., Chytrý, M. & Jansen, F. Implementing the formal language of the vegetation classification expert systems (ESy) in the statistical computing environment R. *Appl Veg Sci* (2021) doi:10.1111/avsc.12562.
80. Hennekens, S. M. & Schaminée, J. H. J. TURBOVEG, a comprehensive data base management system for vegetation data. *J. Veg. Sc.* **12**, 589–591 (2001).
81. Jansen, F. & Dengler, J. GermanSL - eine universelle taxonomische Referenzliste für Vegetationsdatenbanken. *Tuexenia* **28**, 239–253 (2008).
82. Wisskirchen, R. & Haeupler, H. *Standardliste der Farn-und Blütenpflanzen Deutschlands*. (Ulmer, 1998).
83. Jansen, F. & Dengler, J. Plant names in vegetation databases -- a neglected source of bias. *Journal of Vegetation Science* **21**, 1179–1186 (2010).

- 555 84. Schwabe, A. & Kratochwil, A. Pflanzensoziologische Dauerflächen-Untersuchungen im
556 Bannwald 'Flüh' (Südschwarzwald) unter besonderer Berücksichtigung der Weidfeld-Sukzession.
557 *Standort.Wald* **49**, 5–49 (2015).
- 558 85. Poschlod, P., Schreiber, K.-F., Mitlacher, K., Römermann, C. & Bernhardt-Römermann, M.
559 Entwicklung der Vegetation und ihre naturschutzfachliche Bewertung. in *Landschaftspflege und*
560 *Naturschutz im Extensivgrünland. 30 Jahre Offenhaltungsversuche Baden-Württemberg* (eds.
561 Schreiber, K.-F., Brauckmann, H.-J., Broll, G., Krebs, S. & Poschlod, P.) vol. 97 243–288 (2009).
- 562 86. Gonzalez, A. *et al.* Estimating local biodiversity change: a critique of papers claiming no net
563 loss of local diversity. *Ecology* **97**, 1949–1960 (2016).
- 564
- 565

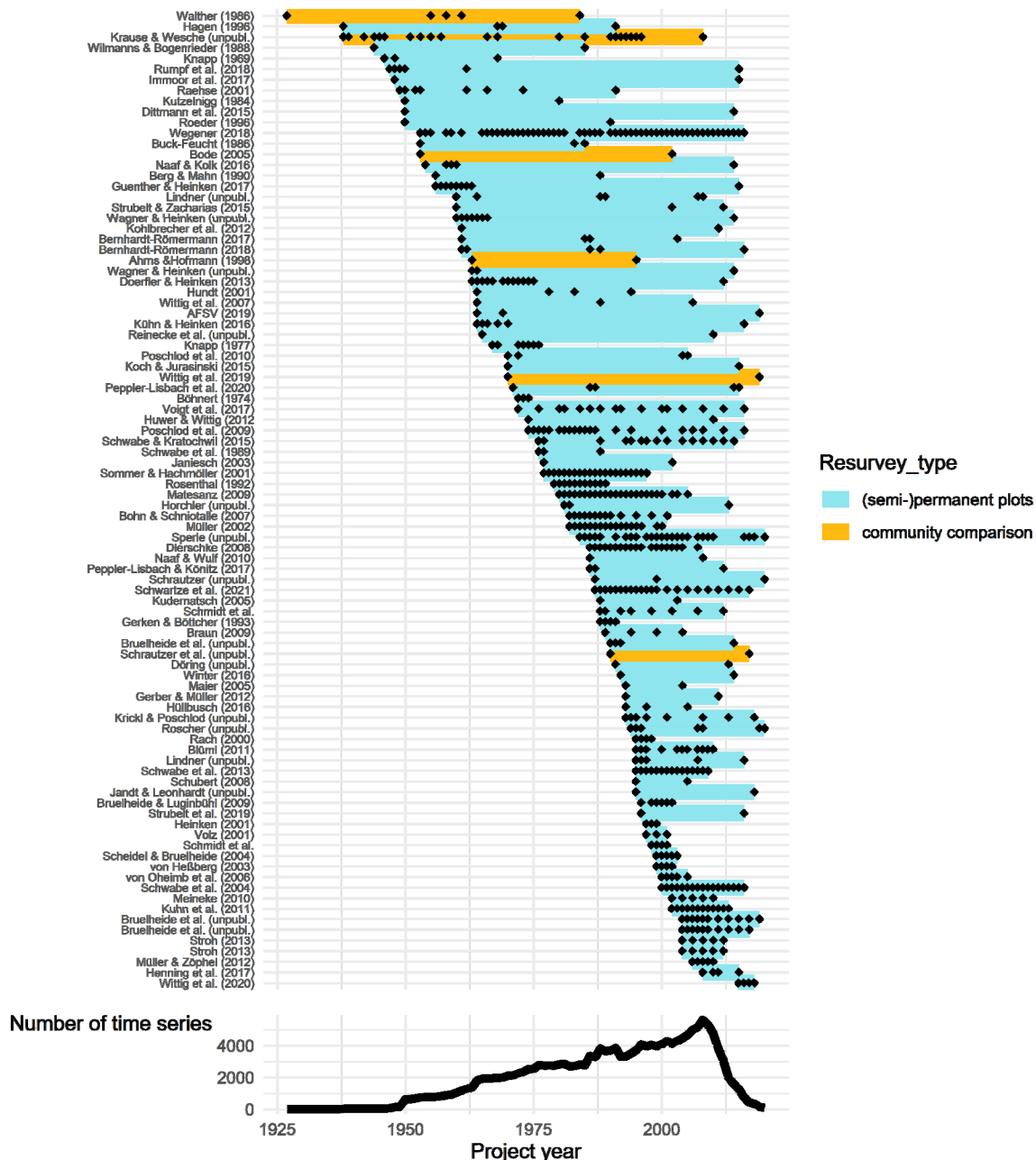
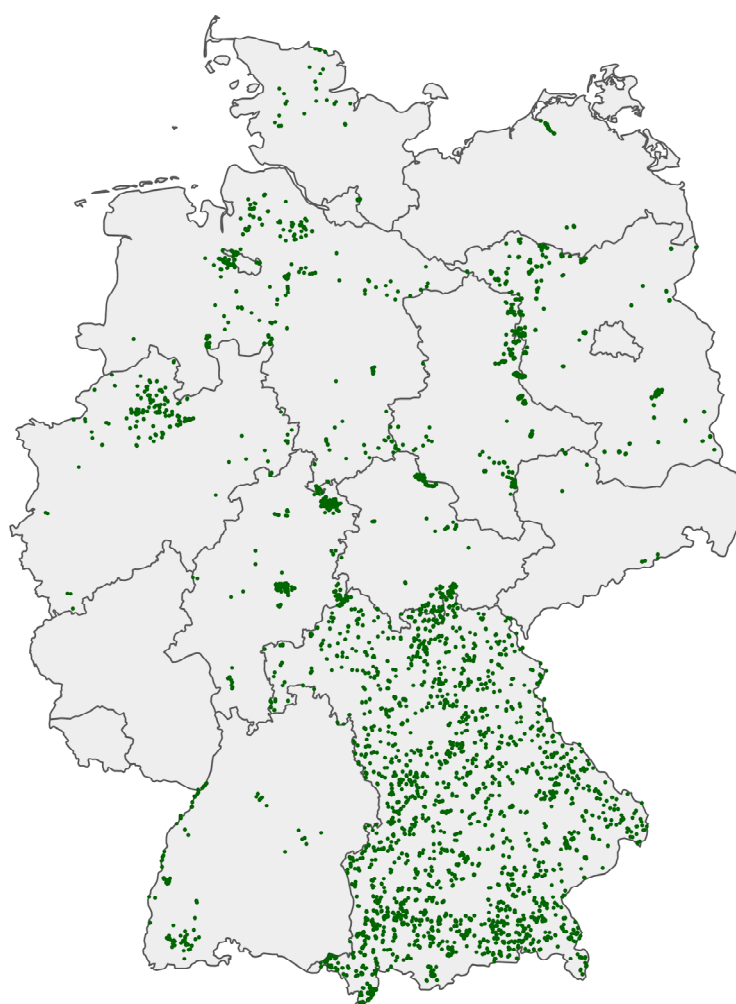


Fig. 1: Temporal coverage of the 92 projects included in the study. The coloured lines indicate the start and the end of a project, black diamonds show in which years surveys were made. Resurvey type refers to either studies that were repeated within a particular community across a site without attempts to match plots (community comparison), or were carried out on matched plots, which were either permanently marked or retrieved from exact descriptions (semi-permanent). The lower graph shows the number of times a particular year was included in the covered time span of any of the projects. For a list of projects see Table 1.



575
576 Fig. 2: Map of all plots of all projects (n=23,641). Note that green dots may represent one or several
577 plots which were summarised under the same plot resurvey ID (n=7,738). The more complete
578 coverage of Bavaria resulted from including the grassland monitoring Bavaria which started in 2002
579 ²⁴.

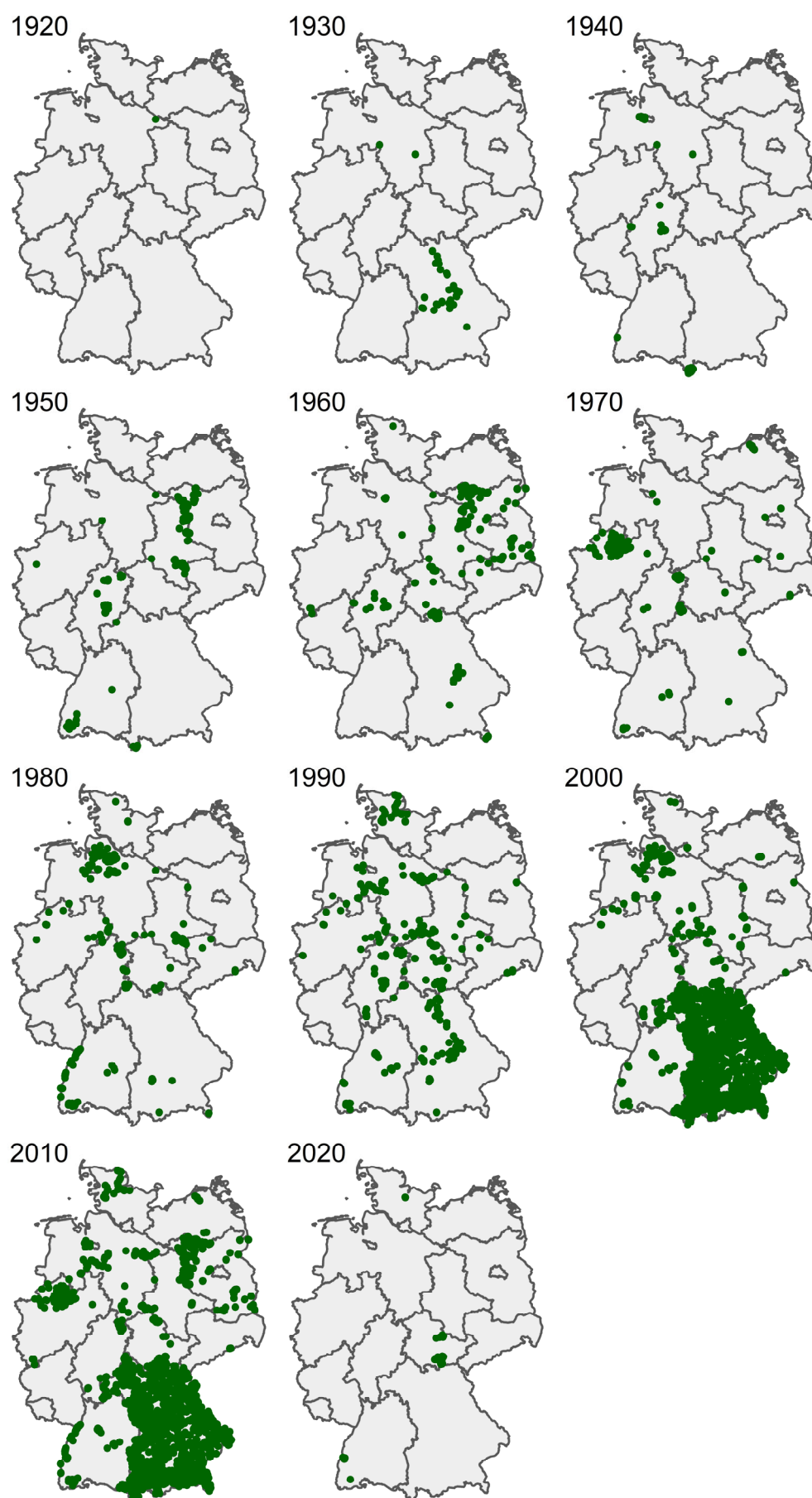


Fig. 3: Map of plot visits by decade, with the year showing the begin of the decade.

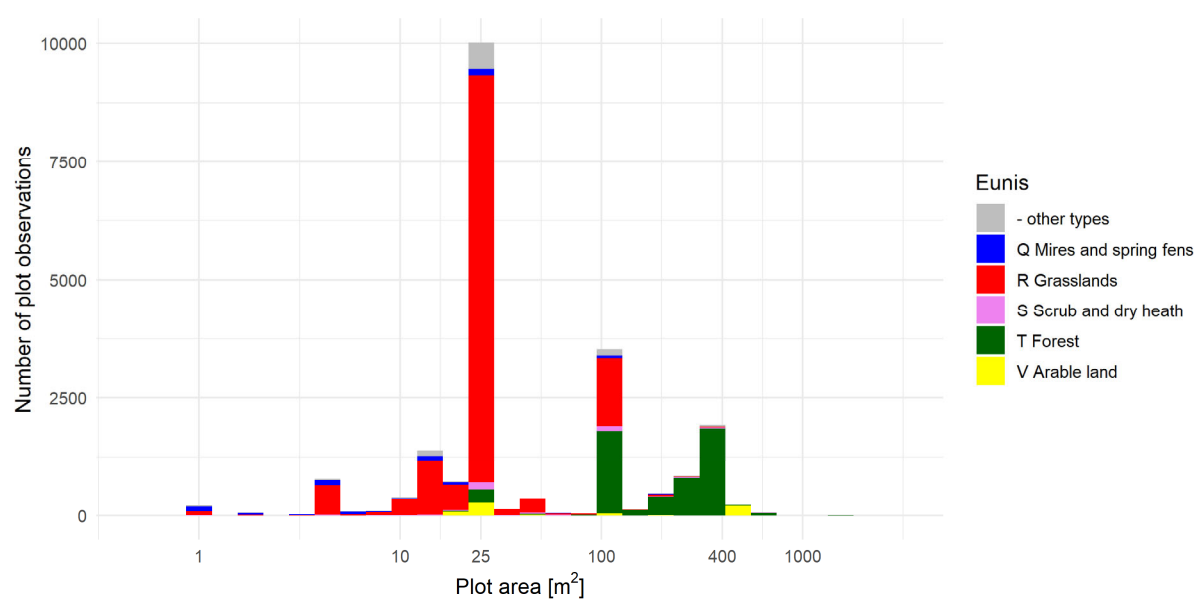


Fig. 4: Histogram of plot size across all records (n=23,641). Colours show Eunis level 1 habitat types.

Table 1: List of all projects included in this study. PROJECT_ID: internal reference number. EUNIS habitat types of time series were assigned to the habitat type by using the earliest plot record that resulted in level 3 EUNIS classification. The classification was based on the EUNIS-ESy expert system⁷⁸ using the R code implementation⁷⁹. If a project included several habitat types, they are shown in decreasing numbers of plot records. Code for habitat types are ?: plots not assigned to any level 3 EUNIS habitat type, +: assigned to more than one level 3 EUNIS habitat type, A: Marine habitats, C: Inland surface waters, H: Inland sparsely vegetated habitats or devoid of vegetation, N: Coastal habitats, Q: Wetlands, R: Grasslands and lands dominated by forbs, mosses or lichens, S: Heathlands, scrub and tundra, T: Forests and other wooded land, V: Vegetated man-made habitats, including arable land.

PROJECT_ID	Project Name	Reference	EUNIS habitat type
77	AFSV (2019)	Arbeitsgemeinschaft Forstliche Standorts- und Vegetationskunde (AFSV) (2019) Nordwest-Eifel - Standorte, Waldgesellschaften, Nutzungen gestern und heute. Exkursionsführer der AFSV-Tagung 2019 in der Nordwesteifel. Verlag Dr. Kessel, Remagen-Oberwinter.	T17
1	Ahrns & Hofmann (1998)	Ahrns, C. & Hofmann, G. (1998) Vegetationsdynamik und Florenwandel im ehemaligen mitteldeutschen Waldschutzgebiet "Hainich" im Intervall 1963 - 1995. Hercynia N.F. 31: 33-64.	T17
4	Berg & Mahn (1990)	Berg, C. & Mahn, E.-G. (1990) Anthropogene Vegetationsveränderungen der Strassenrandvegetation in den letzten 30 Jahren - die Glatthaferwiesen des Raumes Halle Saale. Tuexenia 10: 185-195.	R22, R
2	Bernhardt-Römermann (2017)	(Echinger Lohe)	T1F, T1E, T13, T
3	Bernhardt-Römermann (2018)	(Sonneberg)	T35, T32, T1F, T18, T17, T, S42, R57, R, ?
5	Blüml (2011)	Blüml, V. (2011) Langfristige Veränderungen von Flora und Vegetation des Grünlandes in der Dümmerniederung (Niedersachsen) unter dem Einfluss von Naturschutzmaßnahmen. Dissertation, Universität Bremen.	R55, R36, R35, R21, R, Qb, Q52, Q51
6	Bode (2005)	Bode, F. (2005) Subrezenter Vegetations- und Landschaftswandel im Südschwarzwald. Dissertation, Albert-Ludwigs-Universität Freiburg.	S42
92	Bohn & Schniotalle (2007)	Bohn, U. & Schniotalle, S. (2007) Hochmoor-, Grünland- und Waldrenaturierung im Naturschutzgebiet "Rotes Moor", Hohe Rhön 1981 - 2001: Ergebnisse 20-jähriger wissenschaftlicher	T12, S92, R37, R35, R23!, R23, R1M, Qa, Q24, Q22, ?

		Begleituntersuchungen im Rahmen und im Anschluss an ein E+E-Vorhaben des Bundes. Bundesamt für Naturschutz, Bonn.	
78	Böhnert (1974)	Böhnert, W. (1978) Ökologische Untersuchungen auf den Kreidesandsteinhöhen der Harslebener Berge bei Quedlinburg. Naturschutz und naturkundliche Heimatforschung in den Bezirken Halle und Magdeburg 15 (2): 11-23	S42, R
7	Braun (2009)	Braun, W. (2009) Ein Niedermoor wächst über Hochmoortorf. Ber. d. Bayerischen Botanischen Gesellschaft 79: 127-146. München.	Qb, Qa, Q25, Q24, H26a
88	Bruehlheide & Luginbühl (2009)	Bruehlheide, H. & Luginbühl, U. (2009) Peeking at ecosystem stability: making use of a natural disturbance experiment to analyze resistance and resilience. Ecology 90 (5): 1314-1325.	T1F, T1E, T17, T, H25
17	Bruehlheide et al. (unpubl.)	(Bergwiesen)	R55, R37, R35, R23!, R22, R1M, R, Q24, ?
90	Bruehlheide et al. (unpubl.)	(Preuk)	T35, T1B, T, Sa
91	Bruehlheide et al. (unpubl.)	(Schiessplatz)	T35, R
8	Buck-Feucht (1986)	Buck-Feucht, G. (1986) Vergleich alter und neuer Vegetationsaufnahmen im Forstbezirk Kirchheim unter Teck. Mitteilungen des Vereins für forstliche Standortskunde und Forstpflanzenzüchtung (32): 43-49.	T1E, T18, T17, T13, T
76	Dierschke (2008)	Dierschke, H. (2008) Dynamik und Konstanz an naturnahen Flussufern -27 Jahre Dauerflächenuntersuchungen am Oderufer (Harzvorland). Braunschweiger Geobotanische Arbeiten 9: 119-138.	R55
10	Dittmann et al. (2015)	Dittmann, T., Heinken, T. & Schmidt, M. (2018) Die Wälder von Magdeburgerforst (Fläming, Sachsen-Anhalt) – eine Wiederholungsuntersuchung nach sechs Jahrzehnten. Tuexenia 38: 11-42.	T35, T1E, T1B, T18, T17, T15, T13, T12, T
11	Doerfler & Heinken (2013)	Vegetation change of wet and moist forests in NE German nature reserves	T3M, T3J, T35, T1E, T17, T16, T15, T13, T12, T, S92, Qb, Qa, Q53, +, ?
12	Döring (unpubl.)	Feuchtwälder in den Landkreisen Diepholz und Uelzen; Wiederholungsaufnahmen von PD Dr. Wilfried	T1E, T16, T15, T13, T12, T

		Hakes [NW-FVA] im Rahmen des Forschungsvorhabens "NaLaMa-nT" erhoben	
62	Gerber & Müller (2012)	Gerber, L. & Müller, F. (2012) Flora und Vegetation den Naturschutzgebietes Am Galgenteich Altenberg. Berichte der Arbeitsgemeinschaft sächsischer Botaniker N.F. 21: 65-123.	S42, S32, R1M, R
13	Gerken & Böttcher (unpubl.)	Abschlußbericht, unpubl.	V38, R22, R1A, R, H26a, ?
15	Günther et al. (2021)	Günther, K., Schmidt, M., Quitt, H. & Heinken, T. (2021): Veränderungen der Waldvegetation im Elbe-Havelwinkel von 1960 bis 2015. Tuexenia 41: 53-85.	T3M, T35, T1B, T16, T15, T13, T12, T, S92, S42
16	Hagen (1996)	Hagen, T. (1996) Vegetationsveränderungen in Kalk-Magerrasen des Fränkischen Jura. Laufener Forschungsbericht 4. Bayerische Akademie f. Naturschutz u. Landschaftspflege, Laufen, Salzach. 218 S.	R1A, R16, R13
79	Heinken (2001)	Heinken, A. (2001) Vegetationsentwicklung von Auengrünland nach Wiederüberflutung. Diss. Math.-Nat. Fak. Humboldt-Universität Berlin. 161 S.	R36, R22, R21, R, Qb, Q52, Q51
43	Heinrich, Marstaller & Voigt (2012)	Eine Langzeitstudie zur Sukzession in Halbtrockenrasen - Strukturwandlung in einer Dauerbeobachtungsfläche im Naturschutzgebiet "Leutrat und Cospoth" bei Jena (Thüringen). Artenschutzreport Jena 30: 1-80.	T36, T1H, T19, T17, T, Sa, S35, R51!, R22, R1A, R16, H26a, ?
68	Henning et al. (2017)	Henning, K.; Lorenz, A.; von Oheimb, G.; Härdtle, W.; Tischew, S. Year-round cattle and horse grazing supports the restoration of abandoned, dry sandy grassland and heathland communities by supressing Calamagrostis. Journal for Nature Conservation 40: 120-130.	V38, S42, R1P, R1A, N19, N15
54	von Heßberg (2003)	Von Heßberg, A. (2003) Landschafts- und Vegetationsdynamik entlang renaturierter Flussabschnitte von Obermain und Rodach. Dissertation, Universität Bayreuth.	V15, T13, S91, R55, R21, H25
74	Horchler (unpubl.)	Horchler, P., Henrichfreise, A. Vollmer, I. (2013) Wiederholungsaufnahme von 54 Auenwald-Vegetationsaufnahmen am Oberrhein.	T1H, T1F, T1E, T13, T11, T, Sa, S35, R55, Q52, C23, ?
19	Hüllbusch et al. (2016)	Hüllbusch, E., Brandt, L.M., Ende, P. & Dengler, J. (2016) Little vegetation change during two decades in a dry grassland complex in the Biosphere Reserve Schorfheide-Chorin (NE Germany). Tuexenia 36: 395-412.	R22, R1P, R1B, R1A, R, N15!!

20	Hundt (2001)	Hundt, R. (2001) Ökologisch-geobotanische Untersuchungen an den mitteldeutschen Wiesengesellschaften unter besonderer Berücksichtigung ihres Wasserhaushaltes und ihrer Veränderung durch die Intensivbewirtschaftung. Mitteilungen aus dem Biosphärenreservat Rhön/Thüringen. 3. Monographie. 366 S.	V37, R55, R37, R36, R35, R23!, R22, R1M, R1A, R, Q53, Q43, +
48	Huwer & Wittig (2012)	unpublished data for: Huwer, A. & Wittig, R. (2012) Changes in the species composition of hedgerows. Tuexenia 32: 31-53. Göttingen.	T1E, T1B, T13, T12, T11, T, Sa, S37, ?
21	Immoor et al. (2017)	Immoor, A., Zacharias, D., Müller, J. & Diekmann, M. (2017) A re-visitation study (1948–2015) of wet grassland vegetation in the Stedinger Land near Bremen, North-western Germany. Tuexenia 37: 271-288.	R36, R35, R21, R, Qb
23	Jandt & Leonhardt (unpubl.)	(Kyffhäuser)	S42, R1B!, R1B, R1A, R16, R13
22	Janiesch (2003)	Janiesch, P. (2003) Vegetationsökologische Untersuchungen in einem Erlenbruchwald im nördlichen Münsterland - 25 Jahre im Vergleich. Abhandlungen aus dem Westfälischen Museum für Naturkunde: Vegetation und Fauna in Westfalen (ed Westfälisches Museum für Naturkunde), pp. 71-80, Münster.	T15, T13
70	Knapp (1969)	Knapp, R. (1969) Änderungen in der Vegetation Hessischer Gebirge in den letzten Jahrzehnten. Mitteilungen der Floristisch-Soziologischen Arbeitsgemeinschaft N.F. 14: 274-286	R35, R22, R1M, R
71	Knapp (1977)	Knapp, R. (1977) Dauerflächen-Untersuchungen über die Einwirkung von Haustieren und Wild während trockener und feuchter Zeiten in Mesobromion-Halbtrockenrasen in Hessen. Mitteilungen der Floristisch-Soziologischen Arbeitsgemeinschaft N.F. 19: 269-274	R1A
87	Koch & Jurasinski (2015)	Koch, M. & Jurasinski, G. (2015) Four decades of vegetation development in a percolation mire complex following intensive drainage and abandonment. Plant Ecology & Diversity 8: 49-60	T16, T12, T, R55, R35, Qb, Qa, Q53, Q52, Q51, Q43, Q42, Q41, Q24, C35a, ?
59	Kohlbrecher et al. (2012)	unpublished data for: Kohlbrecher, C., Wesche, K., Hilbig, W., Leuschner, C., Meyer, S. (2012) Veränderungen der Segetalvegetation am Kyffhäusergebirge in den letzten 50 Jahren. Landschaftspflege und Naturschutz in Thüringen 49: 1-9.	V15

24	Krause & Wesche (2011)	unpublished data for: Krause, B., Culmsee, H., Wesche, K., Bergmeier, E. & Leuschner, C. (2011) Habitat loss of floodplain meadows in north Germany since the 1950s. <i>Biodiversity and Conservation</i> 20 (11): 2347-2364.	R22, R21, R1P, R, C35a, A25c
84	Krickl & Poschlod (unpubl.)	(calcareous grasslands SW-Germany)	R1A, R16, H26a
65	Kudernatsch (2005)	Kudernatsch, T. (2005) Auswirkungen der globalen Erwärmung auf die Vegetation alpiner Kalk-Magerrasen im Nationalpark Berchtesgaden. Dissertation TU München, Department für Ökologie, Fachgebiet Geobotanik Weihenstephan. 151 S.	S22, R44, R43I, R
25	Kühn & Heinken (2017)	unpublished data for: Kühn, S.L., Heinken, T. (2017): Vegetationsveränderungen im NSG Bredower Forst im Verlauf von 50 Jahren – Analyse anhand historischer Vegetationsaufnahmen. <i>Natursch. Landschaftspfl. Brandenbg.</i> 26(4): 4-16.	T35, T1E, T1B, T18, T17, T, ?
14	Kuhn et al. (2011)	unpublished data for: Kuhn, G.; Heinz, S.; Meyer, F. (2011) Grünlandmonitoring Bayern, Ersterhebung der Vegetation 2002 - 2008. LfL Schriftenreihe Bayerische Landesanstalt für Landwirtschaft 3.	V38, V37, V15, V, S22, R55, R44, R37, R36, R35, R23I, R23, R22, R21, R1M, R1A, R16, R, Qb, Q53, Q52, Q51, Q43, Q41, C35d, ?
26	Kutzelnigg (1984)	Kutzelnigg, H. (1984) Veränderungen der Ackerwildkrautflora im Gebiet um Moers/Niederrhein seit 1950 und ihre Ursachen. <i>Tuexenia</i> (4): 81-102.	V37, V15
58	Lindner (unpubl.)	(Hechtmoor)	T1B, T16, T, Sb, S92, S41, R, Qb, Qa, Q51, Q42, Q25, Q24, Q21, ?
60	Lindner (unpubl.)	(Süderbrarup)	R55, R52, R22, R1M, R
27	Maier (2005)	Maier, M. (2005) Untersuchung zur Entwicklung von Flora und Fauna in einem Feuchtwiesenschutzgebiet (Naturschutzgebiet Bornhorster Huntewiesen). Diplomarbeit Landschaftsökologie an der Carl von Ossietzky Universität Oldenburg.	R36, R35, Qb, Q53, Q51
28	Matesanz (2009)	Matesanz, S., Brooker, R.W., Valladares, F. & Klotz, S. (2009) Temporal dynamics of marginal steppic vegetation over a 26-year period of substantial environmental change. <i>Journal of Vegetation Science</i> 20 (2): 299-310.	R16

55	Meineke & Menge (2010)	Meineke, T. & Menge, K. (2010) Wirkungskontrolle zum PROFIL Kooperationsprogramm Naturschutz, Teilbereich Besondere Biotoptypen im FFH-Gebiet Bergwiesen und Wolfsbachtal bei Hohegeiß. Im Auftrag des Niedersächsischen Landesbetriebs für Wasserwirtschaft Küsten- und Naturschutz, Hannover.	R23!, R21, R
63	Müller & Zöphel (2012)	Müller, F. & Zöphel, B. (2012) Bestandssituation, Biologie und Ökologie von <i>Gentianella lutescens</i> im Osterzgebirge. Berichte der Arbeitsgemeinschaft sächsischer Botaniker N.F. 21: 139-184	R23!
29	Müller (2002)	Müller, N. (2002) Auswertung der Langzeituntersuchungen von Dauerflächen im Augsburger Stadtgebiet zur Renaturierung von Lechhaiden. Ber. Bayer. Landesamt Umweltschutz (Hrsg.): 97 S.	V38, V, R55, R37, R22, R1A, R16, N15, H26a
30	Naaf & Kolk (2016)	unpublished data for: Naaf, T. & Kolk, J. (2016) Initial site conditions and interactions between multiple drivers determine herb-layer changes over five decades in temperate forests. For Ecol Manag 366: 153-165.	T1H, T1E, T1B, T18, T17, T15, T13, T12, T, Q51, ?
31	Naaf & Wulf (2010)	Naaf, T. & Wulf, M. (2010) unpublished data for: Habitat specialists and generalists drive homogenization and differentiation of temperate forest plant communities at the regional scale. Biol Conserv 143: 848-855.	T1F, T1E, T17, T13, T12, T, Sa
32	Peppler-Lisbach & Könitz (2017)	Peppler-Lisbach, C. & Könitz, N. (2017): Vegetationsveränderungen in Borstgrasrasen des Werra-Meißner-Gebietes (Hessen, Niedersachsen) nach 25 Jahren – Tuexenia 37: 201-228.	S42, R37, R22, R21, R1M, R
44	Peppler-Lisbach et al. (2020)	Peppler-Lisbach, C, Stanik, N, Könitz, N, Rosenthal, G. (2020) Long-term vegetation changes in <i>Nardus</i> grasslands indicate eutrophication, recovery from acidification, and management change as the main drivers. Applied Vegetation Science 23: 508-521. https://doi.org/10.1111/avsc.12513	Sb, Sa, S42, R37, R35, R23!, R23, R22, R1M, R
83	Poschlod et al. (2009)	unpublished data for: Poschlod, P., Schreiber, K.-F., Mitlacher, K., Römermann, C. & Bernhardt-Römermann, M. (2009): Entwicklung der Vegetation und ihre naturschutzfachliche Bewertung. In: Schreiber, K.-F., Brauckmann, H.-J., Broll, G., Krebs, S. & Poschlod, P. (Hrsg.): Landschaftspflege und Naturschutz im Extensivgrünland. 30 Jahre Offenhaltungsversuche Baden-Württemberg. – Naturschutz-Spektrum Themen 97: 243-288.	T1E, R22, R21, R1M, R1A, N19
85	Poschlod et al. (2010)	unpublished data for: Poschlod, P., Kos, M., Roauer, S., Seemann, A., Wiesmann, O., Zeltner, G., Kohler, A. (2006) Long-term monitoring in rivers of south	Qb, Q52, Q51, C23, C22b, ?

		Germany since the 1970ies - macrophytes as indicators for the assessment of water quality. In: Müller, F., Baessler, C., Schubert, H. & Klotz, S. (Eds.): Long-term ecological research. Between Theory and Application. Berlin: Springer, pp. 189-199.	
64	Rach (2000)	Rach, C. (2000) Charakterisierung von Renaturierungsprozessen in Bruchwäldern - Ökologische Untersuchungen in zwei Landschaftsräumen Nordwestdeutschlands. Dissertation Fachbereich Biologie, Geo- und Umweltwissenschaften Universität Oldenburg. 201 S.	T15, T12, T
36	Raehse (2001)	Raehse, S. (2001) Veränderungen der hessischen Grünlandvegetation seit Beginn der 50er Jahre am Beispiel ausgewählter Tal- und Bergregionen Nord- und Mittelhessens. Kassel, University Press GmbH. 222 S.	V15, S42, R55, R37, R36, R35, R22, R21, R1M, R1A, R, Qb, Q53, Q51, N19
37	Reinecke et al. unpubl.	unpublished data for: Reinecke, J., Klemm, G., Heinken, T. (2014): Vegetation change and homogenization of species composition in temperate nutrient-deficient Scots pine forests after 45 yr. J. Veg. Sci. 25: 113-121.	T35, T1B, T, S42, R54, ?
80	Roeder et al. (1996)	Röder, H., Fischer, A., Klöck, W. (1996) Waldentwicklung auf Quasi-Dauerflächen im Luzulo-Fagetum der Buntsandsteinrhön (Forstamt Mittelsinn) zwischen 1950 und 1990. Forstw. CB1. 115, 321-335	T35, T1H, T18, T, S42, R, ?
86	Roscher (unpubl.)	(East Thuringia)	R51!, R22, R1A, R16, R
38	Rosenthal (1992)	Rosenthal, G. (1992) Erhaltung und Regeneration von Feuchtwiesen. Vegetationsökologische Untersuchungen auf Dauerflächen. Diss. Bot. 182: 1-283. Berlin, Stuttgart.	V15, R55, R36, R35, R, Q51
67	Rumpf et al. (2018)	unpublished data for: Rumpf, S., Hülber, K., Klonner, G., Moser, D., Schütz, M., Wessely, J., Willner, W., Zimmermann, N., Dullinger, S. (2018) Range dynamics of mountain plants decrease with elevation. PNAS 115(8):1848-1853.	Sb, S42, S22, R56, R55, R44, R43, R41, R23!, R21, R, H32c, H26b, H24, H23
39	Scheidel & Bruelheide (2004)	Scheidel, U. & Bruelheide, H. (2004) Versuche zur Beweidung von Bergwiesen im Harz. Hercynia N.F. 37: 87-101	S32, R35, R, ?
33	Schmidt et al.	Garbitz, D. (1990): Vegetation und Standortbedingungen im Naturwald "Staufenberg". Dipl.-Arb. Syst.-Geobot. Institut, Universität Göttingen. Melcher, S. (1999): Flora und Vegetation im Naturwald "Großer Staufenberg" (Forstamt	T3M, T35, T1F, T1E, T18, T17, T, Sa, +, ?

		Walkenried, Revier Staufenberg). Dipl.-Arb. Institut f. Waldbau, Abt. I, Universität Göttingen. Mölder, A., Streit, M., Schmidt, W. (2014): When beech strikes back: How strict nature conservation reduces herb-layer diversity and productivity in Central European deciduous forests. <i>Forest Ecology and Management</i> 319: 51-61. Kohls, K. (1994): Geobotanische Untersuchungen in Wäldern des Forstamtes Sellhorn (Lüneburger Heide). Dipl.-Arb. Syst.-Geobot. Institut, Universität Göttingen. Albrecht, B. (2000): Vegetationskundliche Untersuchungen im Naturwaldreservat "Meninger Holz" unter besonderer Berücksichtigung der Vegetationsentwicklung. Dipl.-Arb. FG Naturschutz, FB Biologie, Universität Hamburg. Happe, E. (1995): Vegetation und Standortverhältnisse im Naturwald und Naturschutzgebiet "Totenberg" (Bramwald).Dipl.-Arb. Institut f. Waldbau, Abt. I, Universität Göttingen. Fischer, C., Parth, A., Schmidt, W. (2009): Vegetationsdynamik in Buchen-Naturwäldern. Ein Vergleich aus Süd-Niedersachsen. <i>Hercynia</i> 42: 45-68.	
34	Schmidt et al.	Kompa T., Schmidt, W. (2005): Buchenwald-Sukzession nach Windwurf auf Zechstein-Standorten des südwestlichen Harzvorlandes. <i>Hercynia N.F.</i> 38: 233-261. Schmidt, W. (2002): Die Naturschutzgebiete Hainholz und Staufenberg am Harzrand – Sukzessionsforschung in Buchenwäldern ohne Bewirtschaftung. <i>Tuexenia</i> 22: 151-213. Schmidt, W., Heinrichs, S. (2012) 13 Jahre nach dem Sturm - Vegetationsentwicklung im Buchen-Naturwald "Königsbuche" (südwestliches Harzvorland, Niedersachsen). <i>Hercynia</i> 45: 81-110.	V39, T1F, T1E, T18, T17, T13, T12, T, Sa, S32, R57, R55, R, ?
73	Schrautzer (unpubl.)	Resurvey Eidertal	R55, R35, Q53, Q52
72	Schrautzer et al. (unpubl.)	Resurvey of Härdtle - Beckmann	T17, T13, T12, T
40	Schubert (2008)	Schubert, R. (2008) Vegetationsdynamik in einigen Naturschutzgebieten Sachsen-Anhalts. <i>Mitteilungen florist. Kart. Sachsen-Anhalt (Halle 2008)</i> 13: 53-75.	V38, T, S42, S38, R55, R35, R22, R1A, R, Q51, ?

42	Schwabe & Kratochwil (2015)	Schwabe, A. & Kratochwil, A. (2015) Pflanzensozioökologische Dauerflächen-Untersuchungen im Bannwald "Flüh" (Südschwarzwald) unter besonderer Berücksichtigung der Weidfeld-Sukzession. standort.wald 49: 5-49	T18, T, S42, R52
41	Schwabe et al. (1989)	Schwabe, A., Kratochwil, A. & Bammert, J. (1989) Sukzessionsprozesse im aufgelassenen Weidfeld-Gebiet des "Bannwald Flüh" (Südschwarzwald) 1976-1988 - Mit einer vergleichenden Betrachtung statistischer Auswertungsmethoden. Tuexenia 9: 351-370. Göttingen.	S42, R52, R1M, R, ?
89	Schwabe et al. (2004)	(Grundaufnahmen) unpublished data for: Schwabe, A.; Zehm, A., Nobis, M., Storm, C., Suess, K. (2004) Auswirkungen von Schaf-Erstbeweidung auf die Vegetation primär basenreicher Sand-Ökosysteme. Ber. NNA 1:/2004: 39-54.	V38, V37, V34, V, R1P, R1B, R1A, R13, R, N15!!
57	Schwabe et al. (2013)	unpublished data for Schwabe, A., Suess, K., Storm, C. (2013) What are the long-term effects of livestock grazing in steppic sandy grassland with high conservation value? Results from a 12-year field study. Tuexenia 33: 189-212. Göttingen.	V38, R1P, R1B, R1A, R16, R13, R11, R
69	Schwartz et al. 2021	Schwartz, P., Birkner, L., Velbert, F. & Hölzel, N. (2021) Vielfalt durch extensive Grünlandnutzung. – 30 Jahre Dauermonitoring auf unterschiedlich bewirtschafteten Feuchtgrünlandflächen. Natur in NRW, 1/2021, 16-21. Paderborn. part of unpublished data for: Poptcheva, K., Schwartz, P., Vogel, A., Kleinebecker, T. & Hölzel, N. (2009) Changes in wet meadow vegetation after 20 years of different management in a field experiment (North-West Germany). Agriculture, Ecosystems & Environment, 134 (1-2), 108–114.	R55, R37, R36, R35, R21, R, Q53
61	Sommer & Hachmöller (2001)	Sommer, S. & Hachmöller, B. (2001) Auswertung der Vegetationsaufnahmen von Dauerbeobachtungsflächen auf Bergwiesen im NSG Oelsen bei variierter Mahd im Vergleich zur Brache. Berichte der Arbeitsgemeinschaft sächsischer Botaniker N.F. 18: 99-135	R23!
9	Sperle (unpubl.)		V39, V11, T3K, T12, Sb, S42, S38, R56, R55, R37, R35, R22, R1A, R, Qb, Qa, Q51, Q42, Q41, Q25, Q24, ?
45	Stroh (2013)	Stroh, H.-G. (2013) Wiederholung der vegetationskundlichen Erfassungen an den Dauerbeobachtungsflächen der Kalkmagerrasen des	R1A, ?

		Altendorfer Berges. Bericht für das Jahr 2012. Im Auftrag des Niedersächsischen Landesbetriebs für Wasserwirtschaft Küsten- und Naturschutz, Hannover.	
46	Stroh (2013)	Stroh, H.-G. (2013) Wiederholung der vegetationskundlichen Erfassungen an den Dauerbeobachtungsflächen der Kalkmagerrasen der Weper und des Gladebergs. Zwischenbericht für das Jahr 2012. Im Auftrag des Niedersächsischen Landesbetriebs für Wasserwirtschaft Küsten- und Naturschutz, Hannover.	Sa, R1A, ?
47	Strubelt & Zacharias (2015)	Strubelt, I., Diekmann, M. & Zacharias, D. (2015) Langzeitmonitoring der Vegetation über 52 Jahre im Hartholzauenwald (Querco-Ulmetum minoris Issler 1924) im Haseder Busch (Landkreis Hildesheim). Braunschweiger Geobotanische Arbeiten 11: 173-247	T3M, T1F, T1E, T17, T13, T
66	Strubelt et al. (2019)	Strubelt, I., Diekmann, M., Peppler-Lisbach, C., Gerken, A. & Zacharias, D. (2019) Vegetation changes in the Hasbruch forest nature reserve (NW Germany) depend on management and habitat type. Forest Ecology and Management, 444, 78–88.	T1E, T1B, T18, T17, T13, T
56	Volz (2001)	Volz, H. (2001) Vegetationskundliches Monitoring im NSG Lange Rhön Gebiet Leitgraben. Bearbeitungszeitraum 2001. Gutachten Umweltplanung Volz, Giessen, 62 S.	R57, R35
35	von Oheimb et al. (2006)	v. Oheimb, G., Eischeid, I., Finck, P., Grell, H., Härdtle, W., Mierwald, U., Riecken, U., Sandkühler, J. (2006) Halboffene Weidelandschaft Höltingbaum. Perspektiven für den Erhalt und die naturverträgliche Nutzung von Offenlandlebensräumen. Naturschutz und Biologische Vielfalt 36: 1-280. Landwirtschaftsverlag Münster.	V39, T13, T, R55, R52, R36, R35, R22, R21, R1P, R1M, R, Qb, Q53, Q52, N15, C35a, ?
50	Wagner & Heinken (unpubl.)		T3M, T35, T1H, T1E, T1B, T18, T13, T, S42, R, ?
51	Wagner & Heinken (unpubl.)		T35, T1F, T1E, T1B, T18, T17, T13, T12, T, R55, R51, R1M, R, ?
49	Walther (1986)	Walther, K. (1986) Die Vegetation des Maujahn 1984. Wiederholung der vegetationskundlichen Untersuchung eines wendländischen Moores. Tuexenia 6: 145-193. Göttingen.	T1B, R37, R35, R1P, Q51
52	Wegener (2018)	Wegener, U. (2018) Vegetationswandel des Berggrünlands nach Untersuchungen von 1954 bis 2016. Wege zur Erhaltung der Bergwiesen. Abh. und Ber. aus dem Museum Heineanum 11: 35-101.	R23

53	Wilmanns & Bogenrieder (1988)	Wilmanns, O. & Bogenrieder, A. (1986) Veränderungen der Buchenwälder des Kaiserstuhls im Laufe von vier Jahrzehnten und ihre Interpretation - pflanzensoziologische Tabellen als Dokumente. Abhandlungen aus dem westfälischen Museum für Naturkunde 48(2): 55-80	T18, T, ?
81	Winter (unpubl.)	Winter, R. (2016) Flora und Vegetationsentwicklung der Sukzessionsfläche "Wildnis am Bunker Valentin" in der Bremer Weseraue bei Farge. Bachelorthesis Hochschule Bremen, Studiengang Technische und angewandte Biologie, 61 S.	T, S42, Q51
18	Wittig et al. (2007)	unpublished data for: Wittig, B., Waldmann, T., Diekmann, M. (2007) Veränderungen der Grünlandvegetation im Holtumer Moor über vier Jahrzehnte. Hercynia N.F. 40: 285-300.	V38, V37, V15, V11, V, T16, T15, T13, T12, S92, S41, R55, R52, R37, R36, R35, R22, R21, R, Qa, Q53, Q51, Q22
75	Wittig et al. (2019)	Wittig, B., Müller, J., Mahnke-Ritoff, A. (2019) Talauen-Glatthaferwiesen im Verdener Wesertal (Niedersachsen). Tuexenia 39: 249-265. Göttingen	R22
82	Wittig et al. (2020)	Wittig, B., Müller, J., Quast, R., Miehl, H. (2020) Arnica montana in Calluna-Heiden auf dem Schießplatz Unterlüß (Niedersachsen). Tuexenia 40: 131-146. Göttingen.	S42, R1M

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Table 2: Representativeness of grid cells (“MTBQ,” 0°10′ × 0°6′) with time series. The estimates were obtained from linear models comparing samples with unsampled MTBQs with respect to population density, road density, urban cover, cropland cover and protected area.

Predictors	Population density			Road density			Urban cover			Cropland cover			Protected area		
	Estimates	CI	p	Estimates	CI	p	Estimates	CI	p	Estimates	CI	p	Estimates	CI	p
(Intercept)	30547	30128 – 309645	<0.001	1.59	1.55 – 1.63	<0.001	0.07	0.06 – 0.07	<0.001	0.45	0.44 – 0.45	<0.001	0.01	0.01 – 0.01	<0.001
type [unsampled]	-6686	-7447 – -5925	<0.001	-0.52	-0.59 – -0.45	<0.001	-0.03	-0.03 – -0.03	<0.001	0.01	0.00 – 0.02	0.029	0.01	0.01 – 0.01	<0.001
Observations		11226			25303			12024			12024			29535	
R ² /R ² adjusted		0.026 / 0.026			0.008 / 0.008			0.019 / 0.019			0.000 / 0.000			0.038 / 0.038	

Table 3: Data structure of the Plot-species-abundance file of ReSurveyGermany. For Type: C = character, N = numeric, I = integer (n=23,641)

Field name	Type	Description
PROJECT_ID	I	Number of the resurvey project in ReSurveyGermany; see Table 1
RELEVE_NR	I	Plot observation ID, only unique within a RS_PROJECT, usually the original plot observation ID from the underlying Turboveg 2 database
PROJECT_ID _RELEVE_NR	C	Unique Plot observation ID, by which the project's plot-species-abundance file is linked to the header file, combination of PROJECT_ID and RELEVE_NR
LAYER	I	0: No layer, 1: Tree layer (uppermost), 2: Tree layer (middle), 3: Tree layer (lowest), 4: Shrub layer (uppermost), 5: Shrub layer (low), 6: Herb layer, 7: Juveniles, 8: Seedling (< 1 year), 9: Moss layer.
TaxonName	C	Harmonized taxon name
Cover_Perc	C	Cover of the taxon in per cent

Table 4: Data structure of the header file of ReSurveyGermany. For Type: C = character, N = numeric, I = integer. Per cent of NA values is given by dividing the number of NAs by (n=23,641)

Field name	Type	Description	Number of NAs
RS_PROJECT	C	Unique name of the resurvey project; for the list of the 92 projects and the underlying references see Table 1	0
PROJECT_ID	I	Number of the resurvey project in ReSurveyGermany; see Table 1	0
RS_PLOT	C	Unique (within the site) code of the resurveyed plot; it is used to pair observations from different times recorded in the same plot; gives a unique identifier for the resurveyed plot or set of plots in time if combined with RS_PROJECT. Several plots in the same year might have the same RS_PLOT code if they have to be summarised for temporal comparisons. In these cases, they might also contain the community name.	0
RS_SITE	C	Name of the resurveyed site. For further details see LOCALITY.	0
LOCALITY	C	More detailed description of the locality of the resurveyed site (in German and if available)	8,499
RS_OBSERV	C	Unique code of the one-time observation; combination of RS_SITE, RS_PLOT, YEAR	0
RELEVE_NR	I	Plot observation ID, only unique within a RS_PROJECT, usually the original plot observation ID from the underlying Turboveg 2 database	0
PROJECT_ID _RELEVE_NR	C	Unique Plot observation ID, by which the project's plot-species-abundance file is linked to the header file, combination of PROJECT_ID and RELEVE_NR	0
DATE	C	Date of the record (YYYYMMDD); the exact date if provided by the author, otherwise only the year and month or only year; if the year was not provided by the author, we took the year of the publication	0
YEAR	I	Year of the record (YYYY), extracted from DATE	0
SURF_AREA	N	Plot size [m ²] (only stated if available)	2064

MANIPULATE	C	Binary information (Y/N) about whether the plot was part of a manipulative experiment ("Y") or not ("N"). If "Y", we chose the treatments representing the ambient land use. Observations with NA were to our knowledge not part of an experiment, and thus, can be treated as "N".	15,020
MANIPTYPE	C	Shows the type of treatment in the plot manipulation (partly in German and only if available).	20,255
LAND_USE	C	Land use, often identical with MANIPTYPE (mostly in German, also using the abbreviations used in the particular study, and only if available)	18,149
LOC_METHOD	C	Method of plot (re-)location, 1: Permanently marked plot isolated (i.e. somewhere within the site), 2: Marked plot in a grid (i.e. with regularly spaced neighbor plots), 3: Location with differential GPS, 4: Location with GPS, 5: Location from accurate map, 6: Location from a description, 7: Other	12,607
LOC_METH_COMMENT	C	Detailed description of the location method (if available)	20,163
LONGITUDE	N	Longitude of the plot in decimal degrees, coordinate system WGS-84; this coordinate should refer to the centre of the plot; coordinates were rounded to 2 digits of decimal degrees.	0
LATITUDE	N	Latitude of the plot in decimal degrees, rounded to 2 digits as LONGITUDE	0
PRECISION	I	Uncertainty in m, of coordinates for geographic position of plots, provided by the author or estimated if coordinates were taken from a topographic map. PRECISION refers to the true coordinates, not to those rounded to two digits.	13,034
GEO_LEV	C	Method of how the geographic location was obtained: GPS = Geographical positioning system, MTB = center of the German ordnance map, MTB_4 = center of a quadrant of the German ordnance map, POINT = all other	0
ALTITUDE	I	Elevation [m] (if available)	14,723
ASPECT	N	Compass direction of the slope in degrees [°], 0° = N, 90°=E etc. NA shows plot records either without aspect information or with aspect information when SLOPE is 0.	16,572
SLOPE	I	Inclination of the slope in degrees [°]	18,962

COUNTRY	C	DE for Germany	0
EUNIS		EUNIS level 3 code of the habitat, as obtained by applying the expert system EUNIS-ESy ⁷⁸ and the corresponding R code ⁷⁹ .	0
COVERSCALE	C	Cover scale used for the plot record. 00 = no scale, cover estimated in per cent (%), 01 = Braun/Blanquet (old), 02 = Braun/Blanquet (new), 03 = Londo, 04 = Presence/Absence, 10 = Reichelt & Wilmanns 1973 (short), 26 = Londo (short), 29 = Londo per cent classes, 30 = Londo (modified, in project 9, Sperle et al. unpublished), 31 = Maas & Kohler 1983 (in project 86, Poschlod et al. 2010), 50 = Londo (modified, in project 89, Bruelheide & Luginbühl 2009)	0
REFERENCE	C	Reference number in GVRD, 6 digits referring to the bibliographic reference, found in ReSurveyGermanyReference.csv	51
YEAR_PUBL	I	Year of the publication (if available)	18,057
TABLE_NR	C	Number of the table in the original publication	12,659
TABNAME		Name of the table in the original publication	8,402
NR_IN_TAB	C	Column name in the TABLE_NR	3,789
ORIG_NR		Name of the plot given by the author in the original publication	10,172
ORIG_DB		Name of original Turboveg file, to be used internally for backtracking changes	19,700
COV_TOTAL	I	Total cover of all layers [%] (if available)	18,704
COV_TREES	I	Cover of the tree layer [%] (if available)	20,554

COV_SHRUB S	I	Cover of the shrub layer [%] (if available)	20,520
COV_HERBS	I	Cover of the herb layer [%] (if available)	11,964
COV_MOSSE S	I	Cover of the moss layer (bryophytes and lichens) [%] (if available)	17,512
COV_LITTER	I	Cover of the litter layer on the ground [%] (if available)	20,786
COV_ROCK	I	Cover of the rocks on the plot surface [%] (if available)	21,697
TREE_HIGH	I	Height of the upper tree layer [m] (if available)	22,317
TREE_LOW	I	Height of the lower tree layer [m] (if available)	23,107
SHRUB_HIG H	N	Height of the upper shrub layer [m] (if available)	22,848
SHRUB_LOW	N	Height of the lower shrub layer [m] (if available)	23,478
HERB_HIGH		Mean height of the upper herb layer [cm] (if available)	20,311
HERB_LOW		Mean height of the lower herb layer [cm] (if available)	22,317
HERB_MAX		Maximum height of the herb layer [cm] (if available)	22,627

Table 5: List of all taxa that were harmonised across all projects. The format of the list follows the rules of the ESy system⁷⁸. The taxon names that were aggregated below a broader concept name are indented using five blanks. The number to the right shows the German SL 1.3⁸¹ number for each taxon.

Achillea atrata agg.	18
Achillea atrata	19
Achillea atrata agg.	18
Achillea millefolium agg.	27
Achillea millefolium	31
Achillea millefolium agg.	27
Achillea millefolium subsp. collina	20096
Achillea millefolium subsp. millefolium	32
Achillea pannonica	34
Achillea setacea	36
Acinos arvensis	49
Acinos arvensis	49
Calamintha acinos	976
Satureja acinos	23760
Aconitum lycoctonum	14242
Aconitum lycoctonum	14242
Aconitum lycoctonum subsp. vulparia	20209
Aconitum vulparia	68
Adonis aestivalis	76
Adonis aestivalis	76
Adonis aestivalis var. citrinus	27247
Agrimonia eupatoria	99
Agrimonia eupatoria	99
Agrimonia eupatoria subsp. eupatoria	100
Agrostis canina agg.	120
Agrostis canina	121
Agrostis coarctata	20180
Agrostis stricta	122
Agrostis vinealis	20684
Agrostis capillaris	20178
Agrostis capillaris	20178
Agrostis capillaris subsp. oreophila	7086
Agrostis tenuis	130
Agrostis vulgaris	20179
Agrostis stolonifera agg.	127
Agrostis alba var. stolonifera	27181
Agrostis gigantea	128
Agrostis stolonifera	129
Agrostis stolonifera agg.	127
Agrostis stolonifera subsp. stolonifera	6550
Aira caryophyllea	26920
Aira caryophyllea	26920
Aira caryophyllea subsp. caryophyllea	20218
Alchemilla conjuncta agg.	154
Alchemilla conjuncta agg.	154
Alchemilla hoppeana	166
Alchemilla nitida	10027
Alchemilla fissa agg.	177
Alchemilla fallax	179
Alchemilla fissa	180
Alchemilla fissa agg.	177
Alchemilla hybrida agg.	190
Alchemilla flabellata	194
Alchemilla glaucescens	195
Alchemilla hybrida agg.	190
Alchemilla mollis	200

Alchemilla acutiloba var. mollis	20237
Alchemilla vulgaris agg.	209
Alchemilla acutiloba var. stellata	11694
Alchemilla crinita	219
Alchemilla glabra	235
Alchemilla micans	20278
Alchemilla monticola	245
Alchemilla subcrenata	265
Alchemilla vulgaris	26467
Alchemilla vulgaris agg.	209
Alchemilla vulgaris auct.	20289
Alchemilla xanthochlora	273
Alisma plantago-aquatica agg.	275
Alisma gramineum	276
Alisma lanceolatum	277
Alisma plantago-aquatica	278
Alisma plantago-aquatica agg.	275
Allium scorodoprasum	12756
Allium rotundum	310
Allium scorodoprasum	12756
Allium scorodoprasum subsp. rotundum	20326
Allium senescens	6583
Allium montanum	294
Allium senescens	6583
Allium senescens subsp. montanum	20321
Allium senescens var. montanum	12712
Alopecurus pratensis agg.	334
Alopecurus pratensis	336
Alopecurus pratensis agg.	334
Alyssum alyssoides	345
Alyssum alyssoides	345
Alyssum calycinum	20351
Alyssum montanum	350
Alyssum montanum	350
Alyssum montanum subsp. gmelinii	26457
Alyssum montanum subsp. montanum	26456
Anagallis arvensis	393
Anagallis arvensis	393
Anagallis arvensis subsp. arvensis	394
Anemone narcissiflora	434
Anemonastrum narcissiflorum	20423
Anemone narcissiflora	434
Anthoxanthum aristatum	20071
Anthoxanthum aristatum	20071
Anthoxanthum puelii	466
Anthoxanthum odoratum agg.	463
Anthoxanthum alpinum	464
Anthoxanthum odoratum	465
Anthoxanthum odoratum agg.	463
Anthriscus sylvestris agg.	469
Anthriscus sylvestris	473
Anthriscus sylvestris agg.	469
Anthriscus sylvestris subsp. alpestris	20460
Anthriscus sylvestris subsp. sylvestris	20463
Anthyllis vulneraria	477
Anthyllis vulneraria	477
Anthyllis vulneraria subsp. carpatica	479
Anthyllis vulneraria subsp. pseudovulneraria	14783
Aphanes inexpectata	494
Aphanes inexpectata	494
Aphanes microcarpa	6554
Aquilegia vulgaris agg.	507
Aquilegia atrata	508

<i>Aquilegia vulgaris</i>	510
<i>Arabis bellidifolia</i>	20511
<i>Arabis bellidifolia</i> subsp. <i>bellidifolia</i>	20512
<i>Arabis glabra</i>	520
<i>Arabis glabra</i>	520
<i>Turritis glabra</i>	24405
<i>Arabis hirsuta</i> agg.	521
<i>Arabis hirsuta</i>	523
<i>Arabis nemorensis</i>	20072
<i>Arctium minus</i>	13702
<i>Arctium minus</i>	13702
<i>Arctium minus</i> agg.	547
<i>Lappa communis</i>	14348
<i>Arenaria serpyllifolia</i> agg.	563
<i>Arenaria serpyllifolia</i>	13703
<i>Arenaria serpyllifolia</i> agg.	563
<i>Armeria maritima</i>	581
<i>Armeria elongata</i>	577
<i>Armeria maritima</i>	581
<i>Armeria maritima</i> agg.	575
<i>Armeria maritima</i> subsp. <i>elongata</i>	20584
<i>Armeria maritima</i> var. <i>elongata</i>	20590
<i>Armeria vulgaris</i>	26026
<i>Artemisia campestris</i> agg.	594
<i>Artemisia campestris</i>	596
<i>Artemisia campestris</i> agg.	594
<i>Artemisia campestris</i> subsp. <i>campestris</i>	6466
<i>Artemisia vulgaris</i> agg.	616
<i>Artemisia vulgaris</i>	618
<i>Artemisia vulgaris</i> agg.	616
<i>Arum maculatum</i> agg.	622
<i>Arum maculatum</i>	625
<i>Arum maculatum</i> agg.	622
<i>Asplenium ruta-muraria</i>	674
<i>Asplenium ruta-muraria</i>	674
<i>Asplenium ruta-muraria</i> subsp. <i>ruta-muraria</i>	676
<i>Aster lanceolatus</i> agg.	15106
<i>Aster lanceolatus</i>	693
<i>Aster parviflorus</i>	15085
<i>Atriplex prostrata</i> agg.	20706
<i>Atriplex calotheca</i>	756
<i>Atriplex hastata</i>	20693
<i>Atriplex hastata</i> agg.	755
<i>Atriplex latifolia</i>	760
<i>Atriplex prostrata</i>	762
<i>Atriplex sagittata</i>	754
<i>Atriplex nitens</i>	20702
<i>Aurinia saxatilis</i>	777
<i>Alyssum saxatile</i>	354
<i>Betonica officinalis</i>	826
<i>Betonica officinalis</i>	826
<i>Stachys officinalis</i>	24165
<i>Betula alba</i> agg.	99014
<i>Betula pendula</i>	829
<i>Betula verrucosa</i>	20786
<i>Betula pubescens</i>	830
<i>Betula pubescens</i>	830
<i>Betula pubescens</i> subsp. <i>carpatica</i>	6472
<i>Betula pubescens</i> subsp. <i>pubescens</i>	6471
<i>Bidens frondosa</i>	834
<i>Bidens frondosa</i>	834
<i>Bidens melanocarpa</i>	20788
<i>Bidens tripartita</i>	836

Bidens tripartita	836
Bidens tripartita subsp. tripartita	838
Biscutella laevigata	844
Biscutella laevigata	844
Biscutella laevigata subsp. kernerii	6652
Bistorta officinalis	27744
Bistorta officinalis	27744
Persicaria bistorta	23029
Polygonum bistorta	4420
Bistorta vivipara	20801
Bistorta vivipara	20801
Persicaria vivipara	23045
Polygonum viviparum	4437
Bolboschoenus maritimus	852
Bolboschoenus maritimus	852
Schoenoplectus maritimus	23820
Bothriochloa ischaemum	854
Andropogon ischaemum	20417
Bothriochloa ischaemum	854
Dichanthium ischaemum	21538
Brachypodium pinnatum agg.	862
Brachypodium pinnatum	863
Brachypodium pinnatum agg.	862
Brachypodium rupestre	864
Bromus arvensis	883
Bromus arvensis	883
Bromus arvensis subsp. arvensis	7191
Bromus hordeaceus agg.	895
Bromus hordeaceus	896
Bromus hordeaceus agg.	895
Bromus hordeaceus subsp. hordeaceus	897
Bromus mollis	901
Bromus racemosus agg.	908
Bromus commutatus	909
Bromus racemosus	910
Bromus ramosus agg.	911
Bromus benekenii	912
Bromus ramosus	913
Bromus ramosus agg.	911
Callitriche palustris agg.	999
Callitriche obtusangula	1003
Callitriche palustris	1004
Callitriche palustris agg.	999
Callitriche stagnalis	1006
Campanula rotundifolia agg.	1057
Campanula rotundifolia	1072
Campanula rotundifolia agg.	1057
Campanula scheuchzeri	1073
Cardamine bulbifera	20944
Cardamine bulbifera	20944
Dentaria bulbifera	1896
Cardamine heptaphylla	20951
Dentaria heptaphyllos	91015
Cardamine pratensis agg.	1105
Cardamine dentata	20945
Cardamine palustris	1109
Cardamine pratensis	15133
Cardamine pratensis agg.	1105
Cardaminopsis arenosa	1114
Arabis arenosa	20509
Cardaminopsis arenosa	1114
Cardaminopsis halleri	1116
Arabis halleri	20518

Cardaminopsis halleri	1116
Cardaminopsis petraea	1117
Arabis hispidia	20526
Carduus nutans agg.	1140
Carduus nutans	1143
Carduus nutans agg.	1140
Carex acuta agg.	26775
Carex acuta	20989
Carex acuta subsp. tricostrata	6685
Carex gracilis	1230
Carex arenaria agg.	1159
Carex arenaria	1160
Carex ligerica	1161
Carex pseudobrizzoides	1162
Carex atrata agg.	1164
Carex atrata	14018
Carex atrata agg.	1164
Carex elata	1204
Carex elata	1204
Carex elata subsp. elata	1205
Carex flacca	1216
Carex flacca	1216
Carex glauca	21026
Carex flava agg.	1219
Carex demissa	20011
Carex flava	1220
Carex flava agg.	1219
Carex flava var. oederi	25010
Carex lepidocarpa	1222
Carex oederi	1223
Carex serotina	21070
Carex tumidicarpa	1225
Carex viridula	6693
Carex muricata agg.	1249
Carex divulsa	1250
Carex leersiana	1251
Carex muricata	6687
Carex muricata agg.	1249
Carex muricata subsp. muricata	6689
Carex pairae	1252
Carex spicata	1253
Carex nigra agg.	1254
Carex fusca	21024
Carex nigra	1256
Carex nigra agg.	1254
Carex ornithopoda agg.	1262
Carex ornithopoda	1263
Carex ornithopoda agg.	1262
Carex ovalis	21055
Carex leporina	1240
Carex ovalis	21055
Carex vulpina agg.	1301
Carex otrubae	1302
Carex vulpina	1303
Carex vulpina agg.	1301
Carex × elytroides	10122
Carex × elytroides	10122
Carex acuta × nigra	90526
Carex × figertii	90596
Carex davalliana × dioica	90549
Carex × xanthocarpa	10137
Carex flava × hostiana	90562
Carlina acaulis	1306

Carlina acaulis	1306
Carlina acaulis subsp. simplex	1308
Carlina vulgaris	1312
Carlina vulgaris	1315
Carlina vulgaris subsp. vulgaris	21094
Castanea sativa	1323
Castanea sativa	1323
Castanea vesca	21097
Caucalis platycarpos	1329
Caucalis lappula	21108
Caucalis platycarpos	1329
Centaurea jacea	1347
Centaurea angustifolia	21122
Centaurea jacea	1347
Centaurea jacea agg.	24981
Centaurea jacea subsp. amara	21132
Centaurea jacea subsp. angustifolia	1348
Centaurea nigra	26577
Centaurea nemoralis	21138
Centaurea nigra	26577
Centaurea nigra subsp. nemoralis	1370
Centaurea scabiosa	1390
Centaurea scabiosa	1390
Centaurea scabiosa subsp. scabiosa	1397
Centaurea stoebe	25004
Centaurea maculosa subsp. rhenana	21134
Centaurea rhenana	21146
Centaurea stoebe	25004
Centaureum erythraea	1406
Centaureum erythraea	1406
Centaureum erythraea subsp. erythraea	1407
Centaureum umbellatum	21156
Centaureum littorale	1409
Centaureum littorale	1409
Centaureum minus	7104
Cerastium arvense	1431
Cerastium arvense	1431
Cerastium arvense subsp. arvense	1432
Cerastium fontanum agg.	1449
Cerastium caespitosum	21178
Cerastium fontanum	1450
Cerastium fontanum agg.	1449
Cerastium fontanum subsp. triviale	21187
Cerastium holosteoides	1451
Cerastium triviale	25269
Cerastium vulgare	21213
Cerastium pumilum agg.	1460
Cerastium glutinosum	1461
Cerastium pallens	21198
Cerastium pumilum	1462
Cerastium pumilum agg.	1460
Ceratocarpus claviculata	21221
Ceratocarpus claviculata	21221
Corydalis claviculata	1670
Cerinth glabra	1473
Cerinth alpina	21227
Chaerophyllum hirsutum	26947
Chaerophyllum hirsutum	26947
Chaerophyllum hirsutum agg.	1490
Chaerophyllum villarsii	1493
Chamaecytisus ratisbonensis	1504
Chamaecytisus ratisbonensis	1504
Cytisus ratisbonensis	21484

<i>Chamaecytisus supinus</i>	1506
<i>Chamaecytisus supinus</i>	1506
<i>Cytisus supinus</i>	21486
<i>Chamaespartium sagittale</i>	1509
<i>Chamaespartium sagittale</i>	1509
<i>Genista sagittalis</i>	21992
<i>Genistella sagittalis</i>	2615
<i>Chenopodium album</i> agg.	1514
<i>Chenopodium album</i>	1515
<i>Chenopodium album</i> agg.	1514
<i>Chenopodium strictum</i> subsp. <i>striatifforme</i>	6482
<i>Cirsium acaule</i>	1556
<i>Cirsium acaule</i>	1556
<i>Cirsium acaulon</i>	21327
<i>Cirsium heterophyllum</i>	1569
<i>Cirsium helenioides</i>	21329
<i>Cirsium heterophyllum</i>	1569
<i>Cirsium vulgare</i>	1579
<i>Cirsium lanceolatum</i>	21330
<i>Cirsium vulgare</i>	1579
<i>Cirsium</i> × <i>rigens</i>	26068
<i>Cirsium acaule</i> × <i>oleraceum</i>	90817
<i>Clinopodium vulgare</i>	1593
<i>Calamintha clinopodium</i>	978
<i>Consolida regalis</i>	1627
<i>Consolida regalis</i>	1627
<i>Delphinium consolida</i>	21510
<i>Convolvulus</i>	60816
<i>Convolvulus</i>	60816
<i>Convolvulus arvensis</i>	1632
<i>Conyza canadensis</i>	1638
<i>Conyza canadensis</i>	1638
<i>Erigeron canadensis</i>	21687
<i>Crataegus</i>	61165
<i>Crataegus curvisepala</i>	1697
<i>Crataegus laevigata</i> agg.	1701
<i>Crataegus laevigata</i>	1701
<i>Crataegus lindmanii</i>	1699
<i>Crataegus monogyna</i>	1707
<i>Crataegus monogyna</i> subsp. <i>monogyna</i>	1708
<i>Crataegus monogyna</i> subsp. <i>nordica</i>	1709
<i>Crataegus monogyna</i> var. <i>monogyna</i>	90937
<i>Crataegus oxyacantha</i>	21400
<i>Crataegus rhipidophylla</i>	26677
<i>Crataegus</i> × <i>macrocarpa</i>	1705
<i>Crataegus</i> × <i>media</i>	50021
<i>Crataegus calycina</i>	6733
<i>Crepis bocconi</i>	21408
<i>Crepis pontana</i>	1735
<i>Cruciata laevipes</i>	1766
<i>Cruciata laevipes</i>	1766
<i>Galium cruciata</i>	21963
<i>Cystopteris fragilis</i> agg.	1825
<i>Cystopteris alpina</i>	21473
<i>Cystopteris fragilis</i>	1827
<i>Cytisus nigricans</i>	21483
<i>Cytisus nigricans</i>	21483
<i>Lembotropis nigricans</i>	3333
<i>Cytisus scoparius</i>	1837
<i>Cytisus scoparius</i>	1837
<i>Sarothamnus scoparius</i>	5245
<i>Dactylis glomerata</i> agg.	1842
<i>Dactylis</i>	397

Dactylis aschersoniana	21487
Dactylis glomerata	1843
Dactylis glomerata agg.	1842
Dactylis glomerata subsp. glomerata	13464
Dactylis polygama	1846
Dactylorhiza maculata agg.	1852
Dactylorhiza fuchsii	1853
Dactylorhiza fuchsii × maculata	90986
Dactylorhiza maculata	1857
Dactylorhiza maculata agg.	1852
Dactylorhiza majalis agg.	1861
Dactylorhiza majalis	1862
Dactylorhiza majalis agg.	1861
Dactylorhiza majalis subsp. majalis	1866
Dactylorhiza traunsteineri	1871
Dactylorhiza × carnea	13760
Dactylorhiza maculata × incarnata	90995
Danthonia decumbens	1874
Danthonia decumbens	1874
Danthonia decumbens subsp. decumbens	1876
Sieglingia decumbens	24019
Daucus carota	1886
Daucus	61271
Daucus carota	1886
Daucus carota subsp. carota	6753
Deschampsia cespitosa agg.	1903
Deschampsia cespitosa	1904
Deschampsia cespitosa agg.	1903
Deschampsia flexuosa	20725
Aira flexuosa	20226
Avenella flexuosa	783
Deschampsia flexuosa	20725
Dianthus gratianopolitanus	1934
Dianthus caesius	21522
Dianthus gratianopolitanus	1934
Dianthus superbus	1949
Dianthus superbus	1949
Dianthus superbus subsp. superbus	1952
Digitalis grandiflora	1960
Digitalis ambigua	21540
Dipsacus fullonum	1980
Dipsacus fullonum	1980
Dipsacus sylvestris	20021
Draba aizoides agg.	2000
Draba aizoides	2001
Draba aizoides agg.	2000
Drosera longifolia	21588
Drosera anglica	2025
Drosera longifolia	21588
Dryopteris carthusiana agg.	2030
Dryopteris × deweveri	50029
Dryopteris carthusiana	2032
Dryopteris carthusiana × dilatata	91118
Dryopteris carthusiana agg.	2030
Dryopteris dilatata	2033
Dryopteris expansa	2031
Dryopteris spinulosa	21604
Dryopteris filix-mas agg. s. l.	94728
Dryopteris affinis	2038
Dryopteris filix-mas	2037
Dryopteris filix-mas agg.	2035
Eleocharis palustris agg.	2087
Eleocharis palustris	2091

Eleocharis palustris agg.	2087
Eleocharis uniglumis	2094
Scirpus palustris	23856
Elymus arenosus	27779
Elymus repens subsp. arenosus	6543
Elymus athericus	27782
Elymus pungens	27905
Elymus caninus	20145
Agropyron caninum	103
Elymus caninus	20145
Roegneria canina	23598
Elymus repens	27778
Agropyron repens	27914
Agropyron repens subsp. caesium	6541
Elymus repens	27778
Elymus repens subsp. repens	27781
Elytrigia repens	21639
Triticum repens	24393
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Erodium cicutarium	2199
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<i>Erysimum durum</i>	21726
<i>Erysimum odoratum</i>	2234
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<i>Euphorbia verrucosa</i>	2309
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<i>Euphrasia officinalis</i>	13816
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<i>Euphrasia rostkoviana</i>	2332
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<i>Fallopia convolvulus</i>	2359
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<i>Festuca trachyphylla</i>	2406
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<i>Festuca filiformis</i>	21824
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<i>Festuca lemanii</i>	94730
<i>Festuca ovina</i>	2396
<i>Festuca ovina</i> s. l.	91415
<i>Festuca ovina</i> subsp. <i>ovina</i>	91418
<i>Festuca ovina</i> var. <i>firmula</i>	21845
<i>Festuca ovina</i> agg.	2385
<i>Festuca ovina</i> subsp. <i>glauca</i>	10352
<i>Festuca pallens</i>	2397
<i>Festuca cinerea</i>	2387
<i>Festuca glauca</i>	2392
<i>Festuca glaucina</i>	91400
<i>Festuca pallens</i>	2397
<i>Festuca pallens</i> * <i>glaucina</i>	91420
<i>Festuca pallens</i> subsp. <i>pallens</i>	6792
<i>Festuca quadriflora</i>	21852
<i>Festuca pumila</i>	2416
<i>Festuca quadriflora</i>	21852
<i>Festuca rubra</i> agg.	2417
<i>Festuca heteromalla</i>	7346
<i>Festuca nigrescens</i>	2420
<i>Festuca nigrescens</i> subsp. <i>nigrescens</i>	91414
<i>Festuca rubra</i>	2421
<i>Festuca rubra</i> agg.	2417
<i>Festuca rubra</i> subsp. <i>commutata</i>	21856
<i>Festuca rubra</i> subsp. <i>fallax</i>	13510
<i>Festuca rubra</i> subsp. <i>rubra</i>	2425
<i>Festuca rubra</i> var. <i>genuina</i>	21863
<i>Festuca trichophylla</i>	2426
<i>Festuca rupicola</i>	2402
<i>Festuca rupicola</i>	2402
<i>Festuca sulcata</i>	27166
<i>Festuca valesiaca</i> subsp. <i>sulcata</i>	10354
<i>Festuca valesiaca</i>	13712
<i>Festuca pulchra</i>	13523
<i>Festuca valesiaca</i>	13712
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<i>Festuca norica</i>	2443
<i>Festuca violacea</i> agg.	2441
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<i>Filipendula vulgaris</i>	2462
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<i>Frangula alnus</i>	2472
<i>Rhamnus frangula</i>	23535
<i>Fumana procumbens</i>	2486
<i>Fumana procumbens</i>	2486
<i>Fumana vulgaris</i>	21921
<i>Galeopsis ladanum</i> agg.	2520
<i>Galeopsis angustifolia</i>	2521
<i>Galeopsis ladanum</i>	2522
<i>Galeopsis tetrahit</i> agg.	2526
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<i>Galeopsis tetrahit</i> agg.	2526
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<i>Galium aparine</i>	2533
<i>Galium aparine</i> agg.	2532
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<i>Galium glaucum</i>	2542
<i>Galium mollugo</i> agg.	2548
<i>Galium album</i>	2549
<i>Galium album</i> subsp. <i>album</i>	2550
<i>Galium mollugo</i>	2555
<i>Galium mollugo</i> agg.	2548
<i>Galium palustre</i>	2564
<i>Galium elongatum</i>	2563
<i>Galium palustre</i>	2564
<i>Galium palustre</i> agg.	2561
<i>Galium palustre</i> subsp. <i>elongatum</i>	21974
<i>Galium palustre</i> subsp. <i>palustre</i>	21975
<i>Galium pusillum</i> agg.	2569
<i>Galium anisophyllum</i>	2570
<i>Galium pumilum</i>	2572
<i>Galium pusillum</i> agg.	2569
<i>Galium valdepilosum</i>	2577
<i>Galium rotundifolium</i>	2579
<i>Galium scabrum</i>	21982
<i>Galium saxatile</i>	2585
<i>Galium hircynicum</i>	2543
<i>Galium saxatile</i>	2585
<i>Galium verum</i> agg. s. l.	94733
<i>Galium</i> × <i>pomeranicum</i>	2599
<i>Galium verum</i>	2600
<i>Galium verum</i> agg.	2598
<i>Galium verum</i> subsp. <i>verum</i>	24929
<i>Galium wirtgenii</i>	2601
<i>Gentiana acaulis</i> agg.	91530
<i>Gentiana acaulis</i>	2616
<i>Gentiana clusii</i>	2624
<i>Gentianella ciliata</i>	2656
<i>Gentiana ciliata</i>	22041
<i>Gentianella ciliata</i>	2656
<i>Gentianopsis ciliata</i>	22040
<i>Gentianella germanica</i> agg.	2657
<i>Gentiana germanica</i>	22044
<i>Gentianella aspera</i>	2659
<i>Gentianella germanica</i>	2662

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Gentianella germanica subsp. germanica	7352
Gentianella lutescens	2665
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Geum rivale × urbanum	91547
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Glechoma hederacea	2711
Glechoma hederacea agg.	2710
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Glyceria fluitans agg.	2719
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Helianthemum nummularium	26596
Helianthemum nummularium agg.	2774
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Helianthemum ovatum	2780
Helictotrichon pratense	20728
Avena pratensis	20717
Avenochloa pratensis	788
Avenula pratensis	20732
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Helictotrichon pubescens	20729
Avena pubescens	20718
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Avenula pubescens	20733
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Hepatica nobilis	2815
Anemone hepatica	20422
Hepatica nobilis	2815
Hepatica triloba	10391
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Herniaria glabra	2832
Herniaria glabra subsp. glabra	2833
Hieracium angustifolium	25621
Hieracium glaciale	2885
Hieracium caespitosum	2866
Pilosella caespitosa	12173
Hieracium lactucella	2899
Hieracium auricula	2857
Hieracium lactucella	2899
Pilosella lactucella	12147
Hieracium murorum	25659
Hieracium murorum	25659
Hieracium sylvaticum	2942
Hieracium pilosella	2923
Hieracium pilosella	2923
Pilosella officinarum	14992
Hieracium piloselloides	2924
Hieracium piloselloides	2924
Pilosella piloselloides	12226
Hieracium rothianum	25654
Hieracium setigerum	12219

Hieracium subramosum	10562
depr. Hieracium subramosum	94848
Hippocrepis emerus	21379
Coronilla emerus	1655
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Hornungia petraea	2993
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Hypericum maculatum agg.	3027
Hypericum x desetangsii	3029
Hypericum maculatum	20046
Hypericum maculatum agg.	3027
Hypericum maculatum subsp. maculatum	20047
Hypericum perforatum	3036
Hypericum perforatum	3036
Hypericum perforatum subsp. angustifolium	22208
Hypericum tetrapterum	3042
Hypericum quadrangulum	22214
Hypericum tetrapterum	3042
Inula conyzae	22227
Inula conyza	3069
Inula conyzae	22227
Jasione laevis	3117
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Juncus alpinus	22243
Juncus alpinoarticulatus	91853
Juncus alpinus	22243
Juncus articulatus	3136
Juncus articulatus	3136
Juncus supinus	22278
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Juncus bufonius	3141
Juncus bufonius agg.	3140
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Juncus trifidus	26603
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Juniperus communis	3168
Juniperus communis subsp. communis	3170
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Elyna myosuroides	2102
Kobresia myosuroides	22299
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Koeleria	61398
Koeleria cristata	22305
Koeleria gracilis	22312
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Koeleria pyramidata	3236
Koeleria pyramidata agg.	3233
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Galeobdolon argentatum	21942
Galeobdolon luteum	20026
Galeobdolon luteum agg.	91498
Galeobdolon montanum	20027
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Lamiastrum montanum	3257
Lamium argentatum	24905
Lamium galeobdolon	22338
Lamium galeobdolon agg.	22337
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<i>Larix decidua</i>	3272
<i>Larix europaea</i>	10606
<i>Lathyrus linifolius</i>	3301
<i>Lathyrus linifolius</i>	3301
<i>Lathyrus montanus</i>	22390
<i>Ledum palustre</i>	3328
<i>Ledum palustre</i>	3328
<i>Rhododendron tomentosum</i>	28144
<i>Leontodon helveticus</i>	3346
<i>Leontodon helveticus</i>	3346
<i>Leontodon pyrenaicus</i> subsp. <i>helveticus</i>	7365
<i>Leontodon hispidus</i>	3347
<i>Leontodon hastilis</i>	25306
<i>Leontodon hispidus</i>	3347
<i>Leontodon hispidus</i> subsp. <i>hastilis</i>	22413
<i>Leontodon hispidus</i> subsp. <i>hispidus</i>	6837
<i>Leontodon saxatilis</i>	3354
<i>Leontodon saxatilis</i>	3354
<i>Leontodon taraxacoides</i>	22424
<i>Leucanthemum atratum</i> agg.	3375
<i>Leucanthemum atratum</i> agg.	3375
<i>Leucanthemum halleri</i>	3378
<i>Leucanthemum vulgare</i> agg.	3381
<i>Chrysanthemum leucanthemum</i>	21299
<i>Leucanthemum ircutianum</i>	3384
<i>Leucanthemum maximum</i>	3386
<i>Leucanthemum vulgare</i>	3387
<i>Leucanthemum vulgare</i> agg.	3381
<i>Linaria vulgaris</i> agg.	3429
<i>Linaria vulgaris</i>	3433
<i>Linaria vulgaris</i> agg.	3429
<i>Lindernia dubia</i>	3434
<i>Gratiola anagallidea</i>	13832
<i>Linum perenne</i> agg.	3454
<i>Linum austriacum</i>	3455
<i>Linum leonii</i>	3458
<i>Linum perenne</i>	26993
<i>Lithospermum arvense</i>	3475
<i>Buglossoides arvensis</i> subsp. <i>sibthorpiana</i>	20947
<i>Lithospermum arvense</i>	3475
<i>Lotus corniculatus</i> agg.	3505
<i>Lotus corniculatus</i>	3508
<i>Lotus corniculatus</i> agg.	3505
<i>Lotus corniculatus</i> subsp. <i>corniculatus</i>	22509
<i>Lotus corniculatus</i> var. <i>ciliatus</i>	25841
<i>Lotus tenuis</i>	3510
<i>Lotus pedunculatus</i>	22517
<i>Lotus pedunculatus</i>	22517
<i>Lotus uliginosus</i>	3516
<i>Luzula campestris</i> agg.	3530
<i>Luzula campestris</i>	3531
<i>Luzula campestris</i> agg.	3530
<i>Luzula campestris</i> subsp. <i>multiflora</i>	22525
<i>Luzula multiflora</i>	11817
<i>Luzula pallescens</i>	25388
<i>Luzula sudetica</i>	3536
<i>Luzula luzuloides</i>	3541
<i>Luzula albida</i>	3526
<i>Luzula luzuloides</i>	3541
<i>Luzula luzuloides</i> subsp. <i>rubella</i>	14424
<i>Luzula sylvatica</i>	3547
<i>Luzula sylvatica</i>	3547
<i>Luzula sylvatica</i> subsp. <i>sylvatica</i>	3549

<i>Lycopersicon esculentum</i>	3558
<i>Lycopersicon esculentum</i>	3558
<i>Solanum lycopersicum</i>	24088
<i>Lycopus europaeus</i>	3562
<i>Lycopus europaeus</i>	3562
<i>Lycopus europaeus</i> subsp. <i>europaeus</i>	3563
<i>Malus sylvestris</i> agg.	3580
<i>Malus sylvestris</i>	3582
<i>Malus sylvestris</i> agg.	3580
<i>Matricaria</i>	60765
<i>Chamomilla</i>	67025
<i>Matricaria</i>	60765
<i>Matricaria discoidea</i>	3597
<i>Chamomilla suaveolens</i>	21249
<i>Matricaria discoidea</i>	3597
<i>Matricaria recutita</i>	21248
<i>Chamomilla recutita</i>	21247
<i>Matricaria recutita</i>	21248
<i>Medicago sativa</i> agg.	3616
<i>Medicago</i> × <i>varia</i>	3620
<i>Medicago falcata</i>	3617
<i>Medicago sativa</i>	11820
<i>Medicago sativa</i> agg.	3616
<i>Melampyrum pratense</i>	3638
<i>Melampyrum pratense</i>	3638
<i>Melampyrum pratense</i> subsp. <i>pratense</i>	13853
<i>Melica ciliata</i> agg.	3643
<i>Melica ciliata</i>	3644
<i>Melica ciliata</i> var. <i>nebrodensis</i>	13015
<i>Melica nutans</i> agg.	3648
<i>Melica nutans</i>	3650
<i>Melica nutans</i> agg.	3648
<i>Melica picta</i>	3651
<i>Mentha spicata</i> agg.	3676
<i>Mentha longifolia</i>	3677
<i>Mentha suaveolens</i>	3680
<i>Mercurialis perennis</i> agg.	3691
<i>Mercurialis ovata</i>	3692
<i>Mercurialis perennis</i>	3694
<i>Minuartia hybrida</i>	3720
<i>Alsine tenuifolia</i>	25807
<i>Minuartia rubra</i>	22674
<i>Minuartia fastigiata</i>	3715
<i>Minuartia rubra</i>	22674
<i>Minuartia verna</i>	26607
<i>Minuartia verna</i>	26607
<i>Minuartia verna</i> subsp. <i>gerardii</i>	22675
<i>Minuartia verna</i> subsp. <i>hercynica</i>	6499
<i>Molinia caerulea</i> agg.	3756
<i>Molinia</i>	61408
<i>Molinia arundinacea</i>	3757
<i>Molinia caerulea</i>	3758
<i>Monotropa hypopitys</i> agg.	3762
<i>Monotropa hypophegea</i>	3763
<i>Monotropa hypopitys</i>	3764
<i>Monotropa hypopitys</i> agg.	3762
<i>Montia fontana</i>	3765
<i>Montia fontana</i>	3765
<i>Montia fontana</i> subsp. <i>chondrosperma</i>	3767
<i>Mycelis muralis</i>	3781
<i>Lactuca muralis</i>	22329
<i>Mycelis muralis</i>	3781
<i>Myosotis arvensis</i>	3782

Myosotis arvensis	3782
Myosotis arvensis subsp. arvensis	3783
Myosotis discolor	3785
Myosotis discolor	3785
Myosotis versicolor	22757
Myosotis ramosissima	3792
Myosotis hispida	22735
Myosotis ramosissima	3792
Myosotis scorpioides agg.	20051
Myosotis caespitosa	22731
Myosotis laxa	6500
Myosotis laxiflora	3788
Myosotis multiflora	12098
Myosotis nemorosa	3789
Myosotis nemorosa subsp. brevisetacea	22741
Myosotis palustris	22743
Myosotis palustris agg.	3786
Myosotis palustris s. l.	15315
Myosotis scorpioides	3791
Myosotis scorpioides agg.	20051
Myosotis scorpioides subsp. scorpioides	12104
Myosotis stricta	3804
Myosotis micrantha	22740
Myosotis stricta	3804
Myosotis sylvatica agg.	3793
Myosotis alpestris	3794
Myosotis decumbens	3795
Myosotis sylvatica	3802
Nigritella nigra agg.	3851
Nigritella nigra	7167
Nigritella nigra agg.	3851
Odontites luteus	3863
Euphrasia lutea	21768
Odontites luteus	3863
Orthanthella lutea	3863
Odontites vernus agg.	12023
Odontites ruber	13749
Odontites vernus	3866
Odontites vernus agg.	12023
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Onobrychis viciifolia agg.	3906
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Ononis spinosa agg.	3920
Ononis procurrens	22831
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Ononis spinosa	3925
Ononis spinosa agg.	3920
Ononis spinosa subsp. maritima	22837
Ophrys holoserica	3955
Ophrys fuciflora	22852
Ophrys holoserica	3955
Ophrys insectifera	3956
Ophrys insectifera	3956
Ophrys muscifera	22859
Oreopteris limbosperma	22909
Dryopteris montana	21597
Lastrea limbosperma	22377
Oreopteris limbosperma	22909
Thelypteris limbosperma	5910
Orthilia secunda	4054

Orthilia secunda	4054
Pyrola secunda	23440
Oxalis stricta	22973
Oxalis fontana	4065
Oxalis stricta	22973
Oxytropis montana agg.	4080
Oxytropis jacquinii	4084
Oxytropis montana agg.	4080
Papaver dubium	10700
Papaver dubium	10700
Papaver dubium subsp. lecoqii	22999
Pedicularis palustris	4158
Pedicularis palustris	4158
Pedicularis palustris subsp. palustris	13828
Persicaria amphibia	23027
Persicaria amphibia	23027
Polygonum amphibium	4413
Persicaria dubia	11734
Persicaria dubia	11734
Persicaria mitis	23041
Polygonum mite	4429
Persicaria hydropiper	23032
Persicaria hydropiper	23032
Polygonum hydropiper	4422
Persicaria lapathifolia	23034
Persicaria lapathifolia	23034
Persicaria lapathifolia subsp. pallida	13950
Polygonum lapathifolium	4423
Persicaria maculosa	23038
Persicaria maculosa	23038
Polygonum persicaria	4435
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Persicaria minor	23039
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Petrorhagia prolifera	4187
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Gymnocarpium phegopteris	12299
Phegopteris connectilis	23065
Thelypteris phegopteris	5912
Phleum alpinum agg.	4215
Phleum alpinum	25110
Phleum alpinum agg.	4215
Phleum phleoides	4222
Phleum boehmeri	23073
Phleum phleoides	4222
Phleum pratense agg.	4223
Phleum bertolonii	4224
Phleum pratense	4225
Phleum pratense agg.	4223
Phleum pratense subsp. pratense	27013
Phragmites australis	4229
Phragmites australis	4229
Phragmites communis	23084
Phyteuma orbiculare	26610
Phyteuma orbiculare	26610
Phyteuma orbiculare subsp. orbiculare	24940
Phyteuma spicatum	4264
Phyteuma spicatum	4264

Phyteuma spicatum subsp. occidentale	14758
Phyteuma spicatum subsp. spicatum	4266
Phyteuma spicatum var. coeruleum	23091
Picea abies	4269
Picea abies	4269
Picea excelsa	23106
Picris hieracioides	4274
Picris hieracioides	4274
Picris hieracioides agg.	4272
Pimpinella major	4277
Pimpinella major	4277
Pimpinella major subsp. major	23108
Pimpinella saxifraga agg.	4279
Pimpinella saxifraga	4282
Pimpinella saxifraga agg.	4279
Plantago lanceolata	4320
Plantago lanceolata	4320
Plantago lanceolata subsp. sphaerostachya	23153
Plantago lanceolata var. sphaerostachya	25683
Plantago major	4321
Plantago intermedia	23150
Plantago major	4321
Plantago major subsp. intermedia	4322
Plantago major subsp. major	4323
Plantago maritima agg.	4325
Plantago alpina	4326
Plantago maritima	27766
Plantago strictissima	23161
Plantago media agg.	4332
Plantago media	4333
Plantago media agg.	4332
Poa annua agg.	4343
Poa annua	4344
Poa annua agg.	4343
Poa supina	4345
Poa pratensis agg.	4366
Poa angustifolia	4367
Poa humilis	7372
Poa pratensis	4368
Poa pratensis agg.	4366
Poa pratensis subsp. angustifolia	23193
Poa trivialis	26611
Poa trivialis	26611
Poa trivialis agg.	4372
Poa trivialis subsp. trivialis	7161
Polygala amara agg.	4390
Polygala amara	4391
Polygala amara agg.	4390
Polygala amara subsp. amarella	23205
Polygala amarella	4394
Polygala vulgaris	4405
Polygala oxyptera	23212
Polygala vulgaris	4405
Polygala vulgaris s. str.	10745
Polygala vulgaris subsp. oxyptera	4406
Polygala vulgaris subsp. vulgaris	4407
Polygonatum odoratum	4410
Polygonatum odoratum	4410
Polygonatum officinale	27134
Polygonum aviculare agg.	4415
Polygonum aviculare	4417
Polygonum aviculare agg.	4415
Populus x canadensis	50080

Populus × canadensis	50080
Populus × euamericana	10760
Potentilla argentea agg.	4490
Potentilla argentea	4491
Potentilla argentea agg.	4490
Potentilla erecta	4511
Potentilla erecta	4511
Potentilla tormentilla	23354
Potentilla heptaphylla agg.	4515
Potentilla heptaphylla	4517
Potentilla rubens	23350
Potentilla incana	25757
Potentilla arenaria	4539
Potentilla cinerea	25853
Potentilla cinerea subsp. incana	15377
Potentilla incana	25757
Potentilla × subarenaria	50084
Potentilla palustris	4528
Comarum palustre	21352
Potentilla palustris	4528
Potentilla verna agg.	4538
Potentilla neumanniana	4541
Potentilla pusilla	4542
Potentilla tabernaemontani	20053
Potentilla verna	23355
Potentilla verna agg.	4538
Potentilla verna subsp. vulgaris	28077
Primula veris	4570
Primula officinalis	23378
Primula veris	4570
Primula veris subsp. veris	4575
Primula × digenea	92537
Primula elatior × vulgaris	92534
Primula × media	50085
Primula elatior × veris	92533
Pritzelago alpina	26680
Hutchinsia alpina	3000
Pritzelago alpina	26680
Prunus avium	4582
Cerasus avium	21216
Prunus avium	4582
Prunus avium subsp. avium	24942
Prunus cerasus agg.	4585
Cerasus vulgaris	21220
Prunus cerasus	4586
Prunus mahaleb	4592
Cerasus mahaleb	21219
Prunus mahaleb	4592
Prunus padus	4593
Padus avium	22980
Prunus padus	4593
Prunus spinosa agg.	4597
Prunus × fruticans	4598
Prunus spinosa	4599
Prunus spinosa subsp. fruticans	23396
Pseudolysimachion longifolium	23400
Pseudolysimachion longifolium	23400
Veronica longifolia	6261
Pseudolysimachion spicatum	23404
Pseudolysimachion spicatum	23404
Veronica spicata	6286
Pseudorchis albida	4601
Leucorchis albida	3390

Pseudorchis albida	4601
Pulmonaria officinalis agg.	4636
Pulmonaria obscura	4637
Pulmonaria officinalis	4638
Pulmonaria officinalis agg.	4636
Pulsatilla alpina	15385
Pulsatilla alpina agg.	4642
Pulsatilla vulgaris	26617
Anemone pulsatilla	20428
Anemone pulsatilla subsp. grandis	20429
Pulsatilla vulgaris	26617
Pulsatilla vulgaris agg.	4656
Pulsatilla vulgaris subsp. grandis	23437
Pyrus communis agg.	4669
Pyrus communis	6936
Pyrus communis agg.	4669
Pyrus communis subsp. pyraeaster	23449
Pyrus pyraeaster	4671
Quercus petraea agg.	4678
Quercus petraea	4680
Quercus sessiliflora	23468
Quercus robur	4685
Quercus pedunculata	23466
Quercus robur	4685
Ranunculus acris agg.	4689
Ranunculus acris	4690
Ranunculus acris agg.	4689
Ranunculus aquatilis agg.	4697
Ranunculus aquatilis	4698
Ranunculus aquatilis agg.	4697
Ranunculus peltatus	12030
Ranunculus auricomus agg.	4709
Ranunculus auricomus	11978
Ranunculus auricomus agg.	4709
Ranunculus auricomus s. l.	4710
Ranunculus biflorus	27241
Ranunculus kochii	10821
Ranunculus rectus	6956
Ranunculus bulbosus	4717
Ranunculus bulbosus	4717
Ranunculus bulbosus subsp. bulbosus	12015
Ranunculus ficaria	4721
Ficaria verna	21893
Ranunculus ficaria	4721
Ranunculus ficaria subsp. bulbilifer	4722
Ranunculus flammula agg.	4726
Ranunculus flammula	4727
Ranunculus flammula agg.	4726
Ranunculus reptans	4728
Ranunculus montanus agg.	4743
Ranunculus breynius	23477
Ranunculus montanus	4747
Ranunculus montanus agg.	4743
Ranunculus polyanthemus agg.	4758
Ranunculus nemorosus	4759
Ranunculus nemorosus subsp. polyanthemophyllus	23501
Ranunculus polyanthemoides	4760
Ranunculus polyanthemophyllus	4761
Ranunculus polyanthemus	4762
Ranunculus polyanthemus agg.	4758
Raphanus raphanistrum agg.	4778
Raphanus raphanistrum	4780
Raphanus sativus	4781

Rhinanthus angustifolius	23544
Rhinanthus angustifolius	23544
Rhinanthus angustifolius subsp. angustifolius	23545
Rhinanthus angustifolius subsp. grandiflorus	6569
Rhinanthus serotinus	4832
Rhinanthus aristatus agg.	4817
Rhinanthus aristatus	23551
Rhinanthus glacialis	4819
Rhinanthus minor	4828
Alectorolophus minor	20304
Rhinanthus minor	4828
Ribes rubrum agg.	4850
Ribes rubrum	4851
Ribes rubrum agg.	4850
Rosa canina agg. s. l.	94740
Rosa canina	26665
Rosa canina agg.	4872
Rosa canina agg. s. l.	94740
Rosa corymbifera	26666
Rosa obtusifolia	4897
Rosa rubiginosa agg. s. l.	92752
Rosa elliptica	4887
Rosa micrantha	4893
Rosa rubiginosa	4902
Rosa rubiginosa agg. s. l.	92752
Rosa spinosissima	23649
Rosa pimpinellifolia	4899
Rosa tomentosa agg. s. l.	92754
Rosa tomentosa	4912
Rosa tomentosa agg.	4907
Rosa villosa agg.	4908
Rubus canescens	4952
Rubus canescens	4952
Rubus tomentosus	25709
Rubus grabowskii	7078
Rubus thyrsanthus	5056
Rubus latiarcuatus	24749
Rubus vulgaris var. mollis	11374
Rubus montanus	24778
Rubus candicans	4951
Rubus montanus	24778
Rubus plicatus	5024
Rubus affinis	4931
Rubus plicatus	5024
Rubus sect. Rubus	11351
Rubus fruticosus s. l.	11886
Rubus sect. Rubus	11351
Rumex acetosa agg.	92799
Rumex acetosa	5073
Rumex thyrsiflorus	5108
Rumex acetosella	26619
Rumex acetosella	26619
Rumex acetosella agg.	5074
Rumex acetosella subsp. acetosella	26618
Rumex acetosella subsp. tenuifolius	27201
Rumex tenuifolius	5077
Rumex arifolius	20080
Rumex alpestris	5078
Rumex arifolius	20080
Rumex pseudoalpinus	23661
Rumex alpinus	5079
Rumex × pratensis	50156
Rumex × pratensis	50156

Rumex crispus × obtusifolius	92814
Salix fragilis agg.	5167
Salix × rubens	5169
Salix fragilis	5168
Salix myrsinifolia	5185
Salix myrsinifolia	5185
Salix nigricans	23730
Salix repens agg.	27193
Salix repens	27194
Salix repens agg.	27193
Salix repens s. l.	5191
Salix repens subsp. repens	5193
Salix retusa agg.	5196
Salix retusa	5198
Salix retusa agg.	5196
Salix serpyllifolia	5199
Salix × multinervis	27195
Salix × multinervis	27195
Salix aurita × cinerea	92857
Salix × smithiana	27196
Salix × smithiana	27196
Salix caprea × viminalis	92873
Salix × wimmeriana	50108
Salix caprea × purpurea	92872
Salsola kali	5208
Salsola kali subsp. tragus	5211
Salsola tragus	23749
Sanguisorba minor	5231
Sanguisorba minor	5231
Sanguisorba minor subsp. minor	5232
Scabiosa columbaria agg.	5337
Scabiosa columbaria	5338
Scabiosa columbaria agg.	5337
Scabiosa lucida	5342
Scleranthus annuus agg.	5376
Scleranthus annuus	5377
Scleranthus annuus agg.	5376
Scleranthus polycarpus	5378
Scleranthus × intermedius	92980
Scleranthus annuus × perennis	92978
Securigera varia	21382
Coronilla varia	1662
Securigera varia	21382
Sedum rupestre agg.	5429
Sedum reflexum	5433
Sedum rupestre	23907
Sedum rupestre subsp. reflexum	23910
Sedum sexangulare	5437
Sedum boloniense	23894
Sedum mite	23901
Sedum sexangulare	5437
Sedum telephium agg.	5440
Hylotelephium maximum	7126
Sedum maximum	5441
Sedum telephium	27746
Sedum telephium agg.	5440
Sedum telephium subsp. maximum	23912
Senecio alpinus	5467
Senecio alpinus	5467
Senecio cordatus	23945
Senecio aquaticus agg.	5468
Senecio aquaticus	5469
Senecio aquaticus agg.	5468

Senecio erraticus	5470
Senecio incanus	5485
Senecio carniolicus	23942
Senecio jacobaea	5494
Jacobaea vulgaris	25789
Senecio jacobaea	5494
Senecio nemorensis agg.	5496
Senecio fuchsii	5498
Senecio hercynicus	5499
Senecio nemorensis	94860
Senecio nemorensis agg.	5496
Senecio ovatus	23947
Senecio ovatus subsp. alpestris	7006
Serratula tinctoria	27047
Serratula tinctoria	27047
Serratula tinctoria agg.	5524
Seseli libanotis	5540
Libanotis montana	22460
Libanotis sibirica	22463
Seseli libanotis	5540
Sesleria varia agg.	5558
Sesleria albicans	23996
Sesleria albicans subsp. albicans	27051
Sesleria albicans var. albicans	15414
Sesleria caerulea	25028
Sesleria caerulea subsp. calcaria	13441
Sesleria varia	24991
Setaria pumila	24008
Setaria glauca	5563
Setaria pumila	24008
Silene	60691
Lychnis	60681
Silene	60691
Silene acaulis agg.	5578
Silene acaulis	5579
Silene acaulis agg.	5578
Silene coronaria	11625
Lychnis coronaria	3551
Silene flos-cuculi	24031
Lychnis flos-cuculi	3552
Silene flos-cuculi	24031
Silene latifolia	7012
Melandrium album	22627
Silene alba	5581
Silene latifolia	7012
Silene latifolia subsp. alba	22546
Silene pratensis	20058
Silene noctiflora	5603
Melandrium noctiflorum	22630
Silene noctiflora	5603
Silene nutans agg.	5604
Silene nutans	5606
Silene nutans agg.	5604
Silene viscaria	11627
Lychnis viscaria	3554
Silene viscaria	11627
Viscaria vulgaris	24569
Silene vulgaris	5629
Silene cucubalus	24029
Silene inflata	25277
Silene vulgaris	5629
Silene vulgaris agg.	20067
Silene vulgaris subsp. vulgaris	5634

Silene vulgaris var. humilis	24046
Soldanella alpicola	24100
Soldanella pusilla s. l.	5678
Solidago virgaurea	5682
Solidago virgaurea	5682
Solidago virgaurea subsp. virgaurea	5684
Sonchus asper	5690
Sonchus asper	5690
Sonchus asper subsp. asper	5691
Sorbus aria agg.	5696
Sorbus aria	5697
Sorbus aria agg.	5696
Sorbus aucuparia	5700
Sorbus aucuparia	5700
Sorbus aucuparia subsp. aucuparia	5701
Spergula pentandra agg.	5730
Spergula morisonii	5731
Spergula vernalis	24154
Spergularia media	5734
Spergularia maritima	24145
Spergularia media	5734
Stellaria alsine	5769
Stellaria alsine	5769
Stellaria uliginosa	5782
Stellaria aquatica	24917
Myosoton aquaticum	3805
Stellaria aquatica	24917
Stellaria media agg.	5774
Stellaria media	5775
Stellaria media agg.	5774
Stellaria pallida	5777
Stellaria nemorum	5778
Stellaria nemorum	5778
Stellaria nemorum subsp. nemorum	5780
Stellaria palustris	11573
Stellaria glauca	24184
Stellaria palustris	11573
Stipa calamagrostis	24197
Achnatherum calamagrostis	47
Stipa pennata agg.	5787
Stipa joannis	5797
Stipa pennata	24203
Stipa pennata var. mediterranea	13411
Stipa pulcherrima	13746
Symphytum officinale	26629
Symphytum officinale	26629
Symphytum officinale agg.	5823
Tanacetum corymbosum agg.	5841
Chrysanthemum corymbosum	21294
Tanacetum corymbosum	5843
Tanacetum parthenium	5845
Chrysanthemum parthenium	21315
Tanacetum parthenium	5845
Tanacetum vulgare	5846
Chrysanthemum vulgare	21314
Tanacetum vulgare	5846
Taraxacum sect. Alpina et Hamata et Ruderalia	93219
Taraxacum sect. Alpina	7424
Taraxacum officinale agg.	7442
Taraxacum sect. Alpina et Hamata et Ruderalia	93219
Taraxacum sect. Ruderalia	7434
Taraxacum officinale	14513
Taraxacum sect. Erythrosperma	7428

Taraxacum erythrospermum	14460
Taraxacum laevigatum	14457
Taraxacum levigatum agg.	14458
Taraxacum sect. Erythrosperma	7428
Taraxacum sect. Palustria	7433
Taraxacum palustre	25514
Taraxacum sect. Palustria	7433
Tephroseris helenitis	23949
Senecio helenitis	5482
Tephroseris helenitis	23949
Tephroseris integrifolia	23953
Senecio integrifolius	5492
Tephroseris integrifolia	23953
Teucrium scorodonia	5889
Teucrium scorodonia	5889
Teucrium scorodonia subsp. scorodonia	5891
Thalictrum minus agg.	5896
Thalictrum minus	5898
Thalictrum minus agg.	5896
Thalictrum minus subsp. saxatile	5902
Thlaspi caerulescens	5928
Noccaea caerulescens	22785
Thlaspi cepaeifolium	25000
Thlaspi rotundifolium	5940
Thlaspi perfoliatum	5938
Microthlaspi perfoliatum	22667
Thlaspi perfoliatum	5938
Thymus praecox agg.	5955
Thymus praecox	5957
Thymus praecox agg.	5955
Thymus praecox subsp. polytrichus	5959
Thymus praecox subsp. praecox	5960
Thymus serpyllum subsp. praecox	13239
Thymus pulegioides agg.	5964
Thymus pulegioides	5965
Thymus pulegioides agg.	5964
Thymus pulegioides subsp. pulegioides	7053
Thymus serpyllum subsp. chamaedrys	13255
Thymus serpyllum agg.	6456
Thymus angustifolius	24265
Thymus serpyllum	5966
Thymus serpyllum agg.	6456
Tragopogon pratensis	7141
Tragopogon minor	5999
Tragopogon orientalis	6000
Tragopogon pratensis	7141
Tragopogon pratensis agg.	5998
Tragopogon pratensis subsp. orientalis	24325
Tragopogon pratensis subsp. pratensis	7100
Trichophorum cespitosum	27072
Trichophorum cespitosum	27072
Trichophorum cespitosum subsp. germanicum	24330
Trifolium dubium agg.	6028
Trifolium dubium	6029
Trifolium dubium agg.	6028
Trifolium minus	24352
Trifolium pratense	6057
Trifolium pratense	6057
Trifolium pratense subsp. pratense	6061
Tripleurospermum maritimum agg.	6096
Matricaria inodora	22000
Matricaria maritima	22580
Matricaria perforata	22003

Tripleurospermum inodorum	20061
Tripleurospermum maritimum	6098
Tripleurospermum perforatum	6097
Ulmus glabra	6137
Ulmus glabra	6137
Ulmus montana	24424
Ulmus scabra	24425
Ulmus minor agg.	6139
Ulmus campestris	24420
Ulmus minor	6140
Utricularia minor agg.	6152
Utricularia minor	6154
Utricularia minor agg.	6152
Vaccinium oxycoccos agg.	6161
Oxycoccus palustris	4070
Vaccinium oxycoccos	6163
Vaccinium oxycoccos agg.	6161
Vaccinium uliginosum	6166
Vaccinium uliginosum	6166
Vaccinium uliginosum agg.	6164
Valeriana officinalis agg.	6177
Valeriana officinalis	6178
Valeriana officinalis agg.	6177
Valeriana pratensis	6179
Valeriana procurrens	6180
Valeriana wallrothii	6183
Veronica agrestis agg.	93432
Veronica agrestis	6226
Veronica persica	6271
Veronica polita	6272
Veronica anagallis-aquatica agg.	6231
Veronica anagallis-aquatica	6232
Veronica anagalloides	6233
Veronica catenata	6234
Veronica austriaca agg.	6237
Veronica austriaca	13751
Veronica austriaca subsp. dentata	24471
Veronica austriaca subsp. teucrium	25019
Veronica prostrata	13869
Veronica teucrium	6243
Veronica chamaedrys	13752
Veronica chamaedrys	13752
Veronica chamaedrys agg.	6248
Veronica hederifolia	26766
Veronica hederifolia	26766
Veronica hederifolia agg.	6257
Veronica hederifolia subsp. hederifolia	7101
Veronica sublobata	6259
Veronica verna agg.	6292
Veronica dillenii	6293
Veronica verna	6294
Veronica verna agg.	6292
Vicia cracca agg.	6301
Vicia cracca	6302
Vicia cracca agg.	6301
Vicia tenuifolia	6306
Vicia sativa agg.	6328
Vicia angustifolia	6329
Vicia sativa	6334
Vicia sativa agg.	6328
Vicia sativa subsp. nigra	24521
Vicia sativa var. nigra	24518
Vicia tetrasperma agg.	6338

Vicia tenuissima	6340
Vicia tetrasperma	6341
Vicia tetrasperma agg.	6338
Vincetoxicum hirundinaria agg.	6349
Cynanchum vincetoxicum	21465
Vincetoxicum hirundinaria	6351
Vincetoxicum officinale	24536
Viola canina agg.	24994
Viola canina	6367
Viola canina subsp. canina	6368
Viola persicifolia	6386
Viola persicifolia	6386
Viola stagnina	6394
Viola silvatica agg.	94746
Viola × bavarica	7420
Viola reichenbachiana	6390
Viola reichenbachiana × riviniana	93487
Viola riviniana	6391
Viola silvatica	24559
Viola tricolor agg.	6397
Viola arvensis	6398
Viola arvensis × tricolor	93457
Viola arvensis subsp. arvensis	7208
Viola tricolor	6402
Viola tricolor subsp. tricolor	6405
Viola tricolor var. arvensis	12796
x Festulolium krasanii	93548
Festuca arundinacea × Lolium multiflorum	91392

Table 6: List of all taxon names that were adapted within projects, in addition to the harmonisation across all projects, as shown in Table 4. PROJECT_ID and Project_Name refer to the project in Table 1, RS_PLOT is the plot resurvey ID, which identifies the groups of plots compared in time, RELEVE_NR is the plot observation ID in the Turboveg 2 database (Table 4). Taxon_name_old is the name given by the original author, while Taxon_name_new_1 and Taxon_name_new_2 refer to newly assigned taxon names. In case of two new names the cover values of the old taxon were equally divided among the two new taxa.

PROJECT_ID	Project_Name	RS_Plot	RELEVE_NR	Taxon_name_old	Taxon_name_new_1	Taxon_name_new_2
6	Bode (2005)	HEIDE	331	Cuscuta	Cuscuta	epithymum
6	Bode (2005)	HEIDE	270	Fagus	Fagus	sylvatica
6	Bode (2005)	HEIDE	271	Fagus	Fagus	sylvatica
23	Jandt & Leonhardt (unpubl.)	32	138	Tragopogon	Tragopogon	pratensis
23	Jandt & Leonhardt (unpubl.)	61	186	Tortula	Tortula	ruralis agg.
23	Jandt & Leonhardt (unpubl.)	63	190	Pulsatilla	Pulsatilla	pratensis
23	Jandt & Leonhardt (unpubl.)	56	182	Anthericum	Anthericum	ramosum
23	Jandt & Leonhardt (unpubl.)	80	214	Epipactis	Epipactis	atrorubens
23	Jandt & Leonhardt (unpubl.)	123	6	Trifolium	Trifolium	repens
23	Jandt & Leonhardt (unpubl.)	138	36	Epipactis	Epipactis	atrorubens
23	Jandt & Leonhardt (unpubl.)	146	38	Achillea	Achillea	millefolium agg.
23	Jandt & Leonhardt (unpubl.)	146	38	Tragopogon	Tragopogon	pratensis
23	Jandt & Leonhardt (unpubl.)	205	118	Tragopogon	Tragopogon	pratensis
23	Jandt & Leonhardt (unpubl.)	246	120	Epipactis	Epipactis	atrorubens
23	Jandt & Leonhardt (unpubl.)	251	128	Epipactis	Epipactis	atrorubens
23	Jandt & Leonhardt (unpubl.)	367	166	Tragopogon	Tragopogon	pratensis
23	Jandt & Leonhardt (unpubl.)	373	176	Tragopogon	Tragopogon	pratensis
23	Hagen (1996)	G04	180	Festuca	Festuca	rupicola
23	Hagen (1996)	G09	171	Anemone	Pulsatilla	vulgaris
23	Hagen (1996)	G15	183	Anemone	Pulsatilla	vulgaris
23	Hagen (1996)	G23	290	Epipactis	Epipactis	atrorubens

16	Hagen (1996)	Z20	377	Epipactis	Epipactis atrorubens
16	Heinrich, Marstaller & Voigt (2012)	A_CF5	857	Orchis	Orchis militaris
16	Heinrich, Marstaller & Voigt (2012)	CAT_16A	2014	Orchis	Orchis x hybrida
16	Heinrich, Marstaller & Voigt (2012)	CAT_14C	2004	Orchis	Orchis militaris
16	Heinrich, Marstaller & Voigt (2012)	CAT_16B	2015	Orchis	Orchis militaris
43	Heinrich, Marstaller & Voigt (2012)	CAT_18A	2026	Orchis	Orchis militaris
43	Heinrich, Marstaller & Voigt (2012)	CAT_18D	2029	Orchis	Orchis purpurea
43	Heinrich, Marstaller & Voigt (2012)	CAT_18E	2030	Orchis	Orchis purpurea
43	Heinrich, Marstaller & Voigt (2012)	CAT_19A	2032	Orchis	Orchis purpurea
43	Heinrich, Marstaller & Voigt (2012)	CAT_19B	2033	Orchis	Orchis militaris
43	Heinrich, Marstaller & Voigt (2012)	CAT_19D	2035	Orchis	Orchis militaris
43	Heinrich, Marstaller & Voigt (2012)	CAT_20A	2038	Platanthera	Platanthera chlorantha
43	Heinrich, Marstaller & Voigt (2012)	CAT_20C	2040	Orchis	Orchis militaris
43	Heinrich, Marstaller & Voigt (2012)	CAT_20D	2041	Orchis	Orchis militaris
43	Heinrich, Marstaller & Voigt (2012)	CAT_21B	2045	Orchis	Orchis x hybrida
43	Heinrich, Marstaller & Voigt (2012)	CAT_21C	2046	Orchis	Orchis purpurea
43	Heinrich, Marstaller & Voigt (2012)	CAT_22A	2050	Orchis	Orchis purpurea
43	Heinrich, Marstaller & Voigt (2012)	CAT_22B	2051	Platanthera	Platanthera chlorantha
43	Heinrich, Marstaller & Voigt (2012)	CAT_22E	2054	Orchis	Orchis militaris
43	Heinrich, Marstaller & Voigt (2012)	CAT_23A	2056	Orchis	Orchis purpurea

43	Heinrich, Marstaller & Voigt (2012)	CAT_23B	2057	Platanthera	Platanthera chlorantha
43	Heinrich, Marstaller & Voigt (2012)	CAT_28A	2086	Orchis	Orchis militaris
43	Heinrich, Marstaller & Voigt (2012)	M_CF3	471	Ulmus	Ulmus glabra
43	Heinrich, Marstaller & Voigt (2012)	M_CF3	495	Ulmus	Ulmus glabra
43	Heinrich, Marstaller & Voigt (2012)	M_CF3	519	Ulmus	Ulmus glabra
43	Heinrich, Marstaller & Voigt (2012)	M_CF4	568	Orchis	Orchis x hybrida
43	Heinrich, Marstaller & Voigt (2012)	M_CF6	570	Orchis	Orchis militaris
43	Horchler (unpubl.)	67	93	Callitriche	Callitriche palustris agg.
43	Horchler (unpubl.)	68	94	Callitriche	Callitriche palustris agg.
43	Hüllbusch et al. (2016)	MW9	28	Tragopogon	Tragopogon pratensis
43	Kuhn et al. (2011)	4350724.00_5487257 .00	1608	Campanula	Campanula rapunculoides
74	Kuhn et al. (2011)	4365134.20_5531963 .60	1300	Primula	Primula veris
74	Kuhn et al. (2011)	4365183.00_5532063 .00	1301	Campanula	Campanula rapunculoides
19	Kuhn et al. (2011)	4365308.00_5532308 .00	1302	Campanula	Campanula rapunculoides
14	Kuhn et al. (2011)	4377860.10_5547643 .00	1357	Primula	Primula veris
14	Kuhn et al. (2011)	4395362.00_5271657 .00	2024	Primula	Primula elatior
14	Kuhn et al. (2011)	4415784.00_5532303 .00	832	Primula	Primula veris
14	Kuhn et al. (2011)	4420009.00_5433917 .00	3580	Agrimonia	Agrimonia eupatoria
14	Kuhn et al. (2011)	4421750.00_5573096 .00	34	Ajuga	Ajuga reptans
14	Kuhn et al. (2011)	4450612.00_5509207 .00	769	Ajuga	Ajuga reptans
14	Meineke & Menge (2010)	DBF 4	16	Alchemilla	Alchemilla vulgaris agg.
14	Meineke & Menge (2010)	DBF 4	17	Alchemilla	Alchemilla vulgaris agg.

14	Meineke & Menge (2010)	DBF 4	18	Alchemilla	Alchemilla vulgaris agg.
14	Meineke & Menge (2010)	DBF 4	19	Alchemilla	Alchemilla vulgaris agg.
55	Meineke & Menge (2010)	DBF 8	36	Alchemilla	Alchemilla vulgaris agg.
55	Meineke & Menge (2010)	DBF 8	37	Alchemilla	Alchemilla vulgaris agg.
55	Meineke & Menge (2010)	DBF 8	38	Alchemilla	Alchemilla vulgaris agg.
55	Meineke & Menge (2010)	DBF 8	40	Alchemilla	Alchemilla vulgaris agg.
55	Meineke & Menge (2010)	DBF 10	46	Alchemilla	Alchemilla vulgaris agg.
55	Meineke & Menge (2010)	DBF 10	47	Alchemilla	Alchemilla vulgaris agg.
55	Meineke & Menge (2010)	DBF 10	48	Alchemilla	Alchemilla vulgaris agg.
55	Meineke & Menge (2010)	DBF 10	50	Alchemilla	Alchemilla vulgaris agg.
55	Meineke & Menge (2010)	DBF 11	51	Alchemilla	Alchemilla vulgaris agg.
55	Meineke & Menge (2010)	DBF 11	52	Alchemilla	Alchemilla vulgaris agg.
55	Meineke & Menge (2010)	DBF 11	53	Alchemilla	Alchemilla vulgaris agg.
55	Meineke & Menge (2010)	DBF 11	55	Alchemilla	Alchemilla vulgaris agg.
55	Meineke & Menge (2010)	DBF 13	61	Alchemilla	Alchemilla vulgaris agg.
55	Meineke & Menge (2010)	DBF 13	62	Alchemilla	Alchemilla vulgaris agg.
55	Meineke & Menge (2010)	DBF 13	63	Alchemilla	Alchemilla vulgaris agg.
55	Meineke & Menge (2010)	DBF 13	65	Alchemilla	Alchemilla vulgaris agg.
55	Müller (2002)	K/SH1	119	Thymus	Thymus praecox agg.
55	Peppler-Lisbach & Könitz (2017)	N 86-106	239	Dicranum	Dicranum scoparium
55	Peppler-Lisbach & Könitz (2017)	N 86-192	56	Euphorbia stricta	Euphrasia stricta

55	Peppler-Lisbach & Könitz (2017)	N 86-193	57	Euphorbia stricta	Euphrasia stricta	
29	Peppler-Lisbach et al. (2020)	B_S69	13	Polytrichum	Polytrichum commune	
32	Peppler-Lisbach et al. (2020)	B_S70	14	Polytrichum	Polytrichum commune	Polytrichum formosum
32	Peppler-Lisbach et al. (2020)	B_S82	19	Polytrichum	Polytrichum formosum	
32	Raehse (2001)	M546/50	880	Fragaria	Fragaria vesca	
44	Schmidt et al. (unpubl.)	Hünstollen_KF1_37	1825	Anemone	Anemone nemorosa	
44	Schmidt et al. (unpubl.)	Hünstollen_KF1_40	1828	Anemone	Anemone nemorosa	
44	Schmidt et al. (unpubl.)	Hünstollen_KF1_41	1829	Anemone	Anemone nemorosa	Anemone ranunculoides
36	Schmidt et al. (unpubl.)	Hünstollen_KF1_42	1830	Anemone	Anemone nemorosa	Anemone ranunculoides
33	Schmidt et al. (unpubl.)	Hünstollen_KF1_43	1831	Anemone	Anemone nemorosa	
33	Schmidt et al. (unpubl.)	Hünstollen_KF1_44	1832	Anemone	Anemone nemorosa	
33	Schmidt et al. (unpubl.)	Hünstollen_KF1_45	1833	Anemone	Anemone nemorosa	
33	Schmidt et al. (unpubl.)	Hünstollen_KF1_46	1834	Anemone	Anemone nemorosa	
33	Schmidt et al. (unpubl.)	Hünstollen_KF1_47	1835	Anemone	Anemone nemorosa	
33	Schmidt et al. (unpubl.)	Hünstollen_KF1_48	1836	Anemone	Anemone nemorosa	Anemone ranunculoides
33	Schmidt et al. (unpubl.)	Hünstollen_KF1_49	1837	Anemone	Anemone nemorosa	
33	Schmidt et al. (unpubl.)	Hünstollen_KF1_50	1838	Anemone	Anemone nemorosa	
33	Schmidt et al. (unpubl.)	Hünstollen_KF1_51	1839	Anemone	Anemone nemorosa	
33	Schmidt et al. (unpubl.)	Hünstollen_KF2_30	1869	Anemone	Anemone nemorosa	Anemone ranunculoides
33	Schmidt et al. (unpubl.)	Hünstollen_KF2_32	1871	Anemone	Anemone nemorosa	Anemone ranunculoides
33	Schmidt et al. (unpubl.)	Hünstollen_KF2_34	1873	Anemone	Anemone nemorosa	Anemone ranunculoides
33	Schmidt et al. (unpubl.)	Hünstollen_KF2_35	1874	Anemone	Anemone nemorosa	Anemone ranunculoides
33	Schmidt et al. (unpubl.)	Hünstollen_KF2_37	1876	Anemone	Anemone nemorosa	Anemone ranunculoides
33	Schmidt et al. (unpubl.)	Hünstollen_KF2_41	1880	Anemone	Anemone nemorosa	
33	Schmidt et al. (unpubl.)	Hünstollen_KF2_42	1881	Anemone	Anemone nemorosa	

	Schmidt et al.				Anemone nemorosa
33	(unpubl.)	Hünstollen_KF2_43	1882	Anemone	nemorosa
	Schmidt et al.				Anemone nemorosa
33	(unpubl.)	Hünstollen_KF2_44	1883	Anemone	nemorosa
	Stroh			Tortella	Tortella
33	(2013)	DBF_11	55	tortuosa	inclinata
	Strubelt & Zacharias				Campanula
33	(2015)	8	41	Campanula	trachelium

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