

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

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- 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

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

121

122 **Background & Summary**

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

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

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

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

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

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

189

190 **Data Records**

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

205 1927 and 2020. In total, ReSurvey Germany comprises 23,641 vegetation-plot records and 458,311
206 species cover records.

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

218 While we did not deliberately exclude certain habitat types, the data mainly consist of semi-natural
219 to intensively managed grasslands and forests. Thus, the time series in ReSurveyGermany are biased
220 with respect to habitat types. We assigned EUNIS habitat types to each plot record. This was
221 accomplished by using the expert system EUNIS-ESy⁷⁸ and the corresponding R code⁷⁹. Plot records
222 covered a total of 92 EUNIS habitat types out of the 150 ones distinguished for Germany. About 63%
223 of the 23,641 plot records came from grasslands (level 1 EUNIS habitat R, n=14,849), followed by
224 forests and other wooded lands (T, n= 5,440, 23%). In contrast, arable land (V, vegetated man-made
225 habitats), which makes up more than 36% of the land cover in Germany, was only represented by 3%
226 (816 plot records).

227

228 **Database organisation**

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

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

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

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

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

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

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

288 Geographic information is given by LONGITUDE, LATITUDE and ALTITUDE. Current monitoring
289 programs and data protection of land owners do not allow us to provide location information at the
290 highest available precision. In addition, some records contain occurrence data of rare and protected
291 species. Thus, information on longitude and latitude was rounded to two decimal digits. Compared to
292 the coordinates at highest available precision, rounding resulted in a mean uncertainty of 371 m (\pm
293 138 m standard deviation), and thus, is within the somewhat limited range of accuracy provided by
294 many custodians in the first place (see field PRECISION). If more precise coordinates are required for
295 certain analysis we recommend to contact the respective data owners (as shown in Table 1).

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

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

304

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

308

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

316

317 **Usage notes**

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

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

322 <https://idata.idiv.de/ddm/Data/ShowData/3508?version=0> and the full dataset here:

323 <https://cloud.uni-halle.de/s/wei1ljqnq2Wet0A>

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

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

336

337 **Code availability**

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

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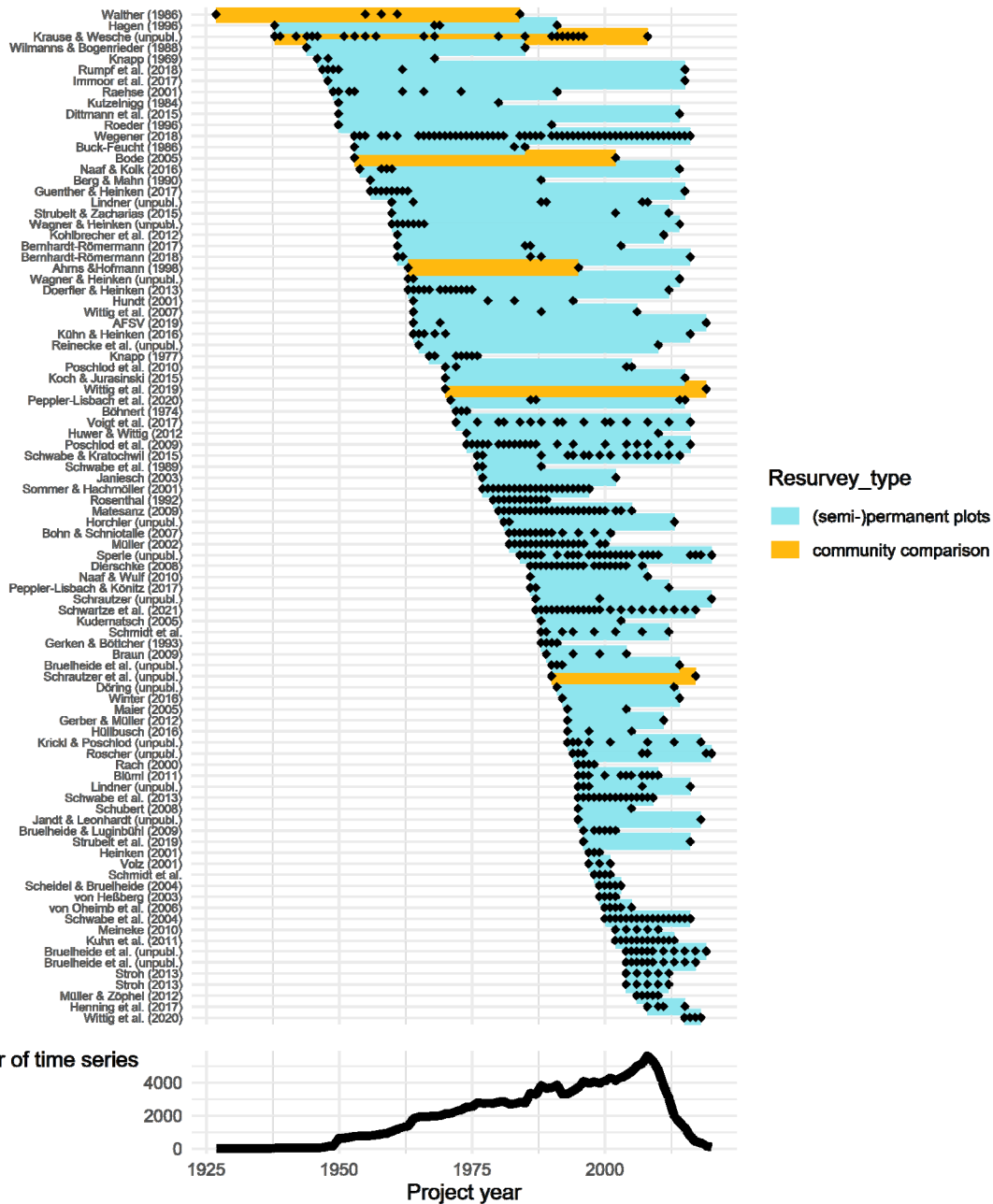
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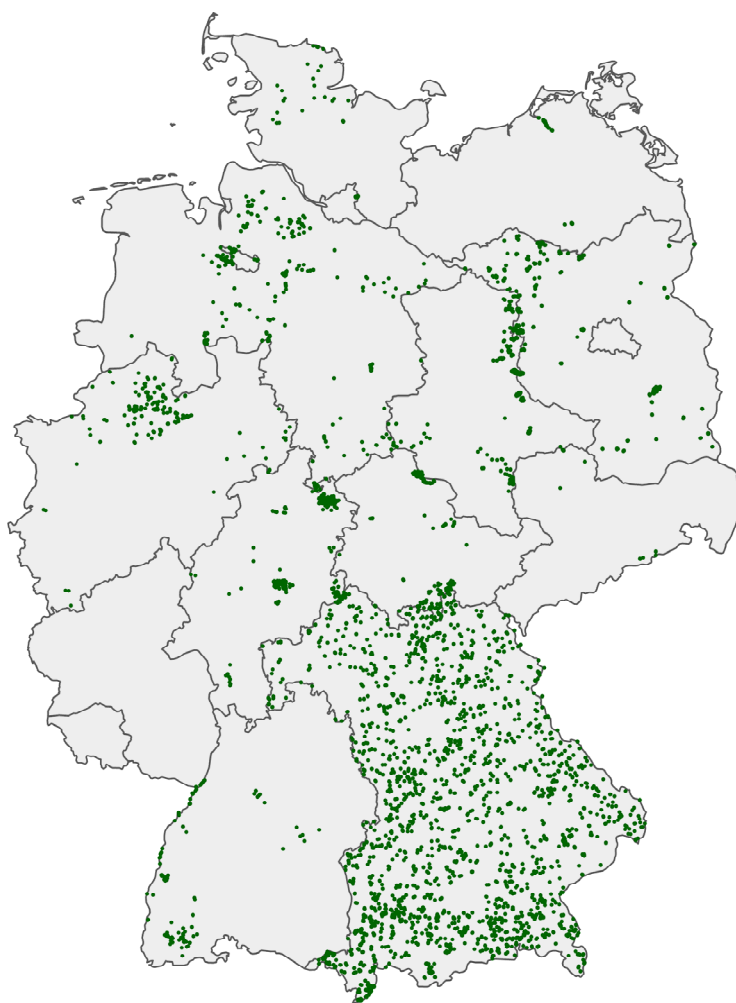
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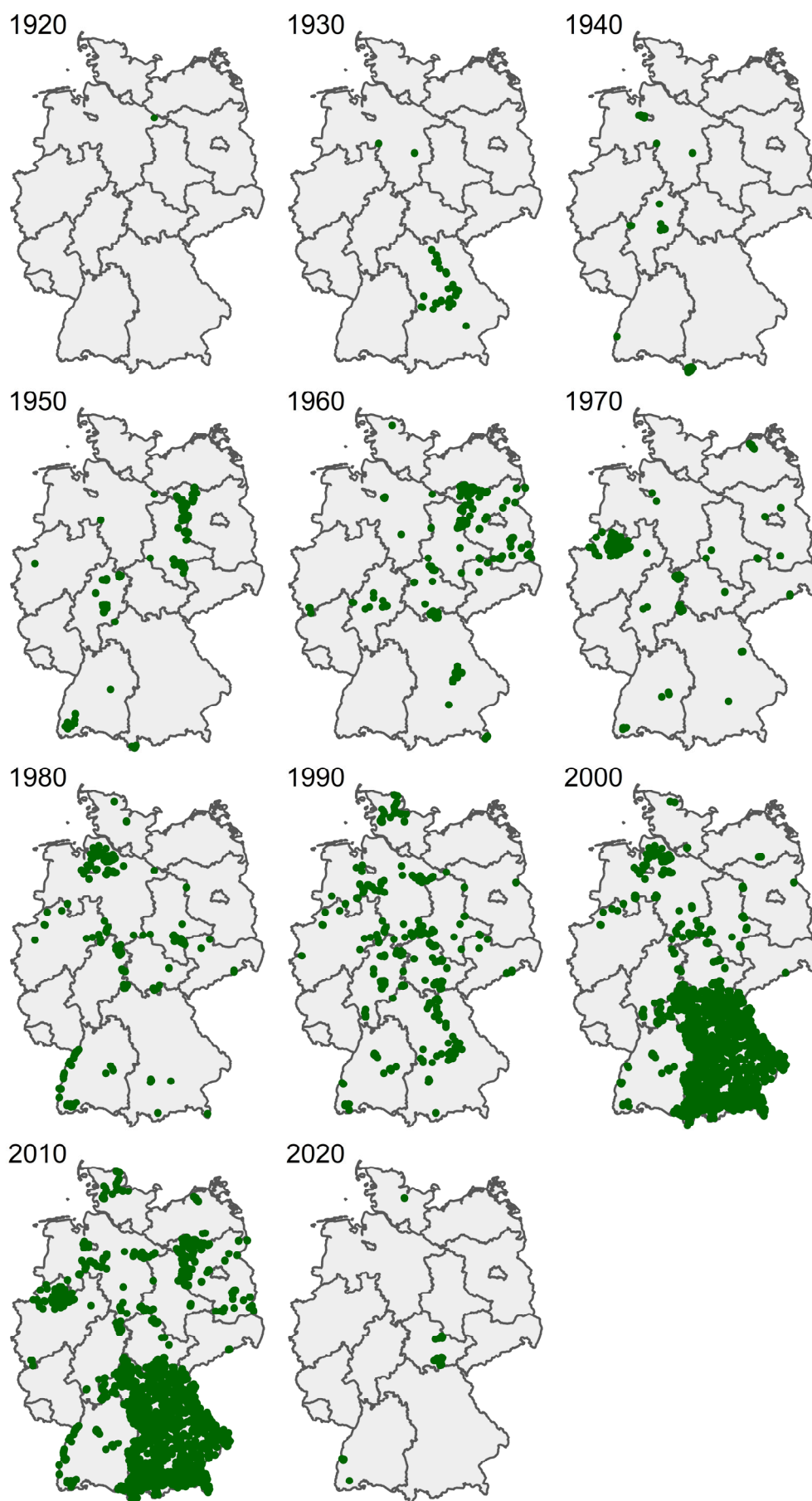
567 Fig. 1: Temporal coverage of the 92 projects included in the study. The coloured lines indicate the
 568 start and the end of a project, black diamonds show in which years surveys were made. Resurvey
 569 type refers to either studies that were repeated within a particular community across a site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

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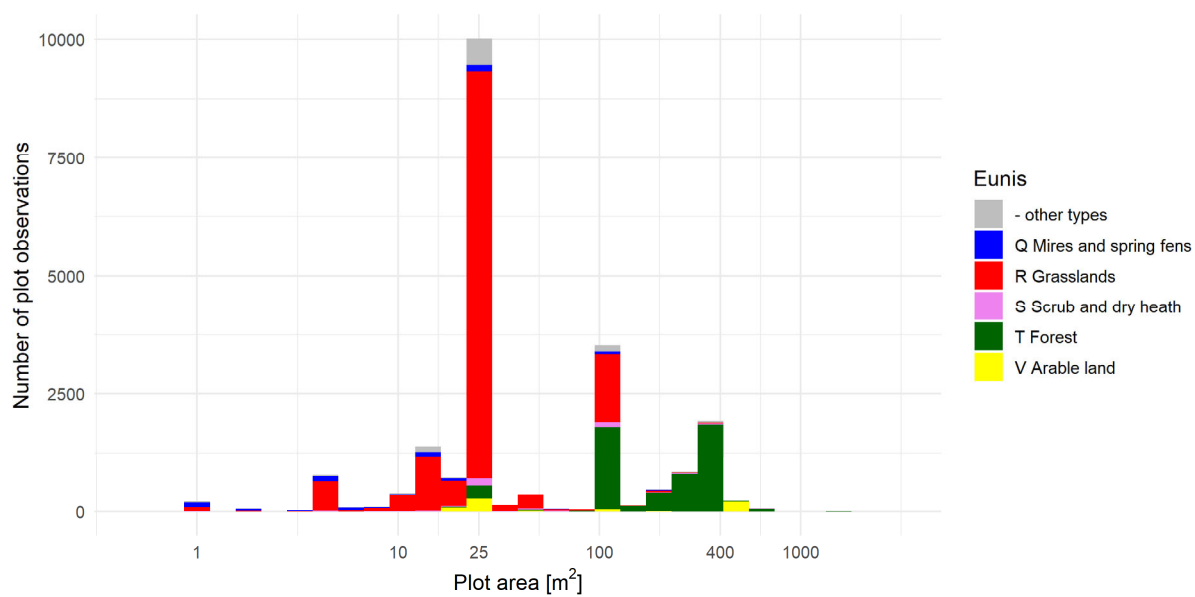
575

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.



580

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



582

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

584

585 Table 1: List of all projects included in this study. PROJECT_ID: internal reference number.
 586 EUNIS habitat types of time series were assigned to the habitat type by using the earliest
 587 plot record that resulted in level 3 EUNIS classification. The classification was based on the
 588 EUNIS-ESy expert system⁷⁸ using the R code implementation⁷⁹. If a project included several
 589 habitat types, they are shown in decreasing numbers of plot records. Code for habitat types
 590 are ?: plots not assigned to any level 3 EUNIS habitat type, +: assigned to more than one
 591 level 3 EUNIS habitat type, A: Marine habitats, C: Inland surface waters, H: Inland sparsely
 592 vegetated habitats or devoid of vegetation, N: Coastal habitats, Q: Wetlands, R: Grasslands
 593 and lands dominated by forbs, mosses or lichens, S: Heathlands, scrub and tundra, T: Forests
 594 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. <i>Hercynia</i> 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. <i>Tuexenia</i> 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	Bruelheide & Luginbühl (2009)	Bruelheide, 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	Bruelheide et al. (unpubl.)	(Bergwiesen)	R55, R37, R35, R23!, R22, R1M, R, Q24, ?
90	Bruelheide et al. (unpubl.)	(Preuk)	T35, T1B, T, Sa
91	Bruelheide 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 Standortkunde 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 Magdeburgerforth (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 "Leutratal 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, R43!, 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, R23!, 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 Augsburgener 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., Klöner, 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, +, ?

		<p>Walkenried, Revier Staufenberg). Dipl.-Arb. Institut f. Waldbau, Abt. I, Universität Göttingen.</p> <p>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.</p> <p>Kohls, K. (1994): Geobotanische Untersuchungen in Wäldern des Forstamtes Sellhorn (Lüneburger Heide). Dipl.-Arb. Syst.-Geobot. Institut, Universität Göttingen.</p> <p>Albrecht, B. (2000): Vegetationskundliche Untersuchungen im Naturwaldreservat "Meninger Holz" unter besonderer Berücksichtigung der Vegetationsentwicklung. Dipl.-Arb. FG Naturschutz, FB Biologie, Universität Hamburg.</p> <p>Happe, E. (1995): Vegetation und Standortverhältnisse im Naturwald und Naturschutzgebiet "Totenberg" (Bramwald).Dipl.-Arb. Institut f. Waldbau, Abt. I, Universität Göttingen.</p> <p>Fischer, C., Parth, A., Schmidt, W. (2009): Vegetationsdynamik in Buchen-Naturwäldern. Ein Vergleich aus Süd-Niedersachsen. <i>Hercynia</i> 42: 45-68.</p>	
34	Schmidt et al.	<p>Kompa T., Schmidt, W. (2005): Buchenwald-Sukzession nach Windwurf auf Zechstein-Standorten des südwestlichen Harzvorlandes. <i>Hercynia N.F.</i> 38: 233-261.</p> <p>Schmidt, W. (2002): Die Naturschutzgebiete Hainholz und Staufenberg am Harzrand – Sukzessionsforschung in Buchenwäldern ohne Bewirtschaftung. <i>Tuexenia</i> 22: 151-213.</p> <p>Schmidt, W., Heinrichs, S. (2012) 13 Jahre nach dem Sturm - Vegetationsentwicklung im Buchen-Naturwald "Königsbuche" (südwestliches Harzvorland, Niedersachsen). <i>Hercynia</i> 45: 81-110.</p>	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 (Quercus-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., Pepler-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., Eiseid, I., Finck, P., Grell, H., Härdtle, W., Mierwald, U., Riecken, U., Sandkühler, J. (2006) Halboffene Weidelandschaft Höltigbaum. 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. <i>Hercynia N.F.</i> 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). <i>Tuexenia</i> 39: 249-265. Göttingen	R22
82	Wittig et al. (2020)	Wittig, B., Müller, J., Quast, R., Miehlich, H. (2020) <i>Arnica montana</i> in <i>Calluna</i> -Heiden auf dem Schießplatz Unterlüß (Niedersachsen). <i>Tuexenia</i> 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

MANIPULAT E	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_METHO D	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

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

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

Cardaminopsis halleri	1116
Cardaminopsis petraea	1117
Arabis hispida	20526
Carduus nutans agg.	1140
Carduus nutans	1143
Carduus nutans agg.	1140
Carex acuta agg.	26775
Carex acuta	20989
Carex acuta subsp. tricostata	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

<i>Carlina acaulis</i>	1306
<i>Carlina acaulis</i> subsp. <i>simplex</i>	1308
<i>Carlina vulgaris</i>	1312
<i>Carlina vulgaris</i>	1315
<i>Carlina vulgaris</i> subsp. <i>vulgaris</i>	21094
<i>Castanea sativa</i>	1323
<i>Castanea sativa</i>	1323
<i>Castanea vesca</i>	21097
<i>Caucalis platycarpus</i>	1329
<i>Caucalis lappula</i>	21108
<i>Caucalis platycarpus</i>	1329
<i>Centaurea jacea</i>	1347
<i>Centaurea angustifolia</i>	21122
<i>Centaurea jacea</i>	1347
<i>Centaurea jacea</i> agg.	24981
<i>Centaurea jacea</i> subsp. <i>amara</i>	21132
<i>Centaurea jacea</i> subsp. <i>angustifolia</i>	1348
<i>Centaurea nigra</i>	26577
<i>Centaurea nemoralis</i>	21138
<i>Centaurea nigra</i>	26577
<i>Centaurea nigra</i> subsp. <i>nemoralis</i>	1370
<i>Centaurea scabiosa</i>	1390
<i>Centaurea scabiosa</i>	1390
<i>Centaurea scabiosa</i> subsp. <i>scabiosa</i>	1397
<i>Centaurea stoebe</i>	25004
<i>Centaurea maculosa</i> subsp. <i>rhenana</i>	21134
<i>Centaurea rhenana</i>	21146
<i>Centaurea stoebe</i>	25004
<i>Centaureum erythraea</i>	1406
<i>Centaureum erythraea</i>	1406
<i>Centaureum erythraea</i> subsp. <i>erythraea</i>	1407
<i>Centaureum umbellatum</i>	21156
<i>Centaureum littorale</i>	1409
<i>Centaureum littorale</i>	1409
<i>Centaureum minus</i>	7104
<i>Cerastium arvense</i>	1431
<i>Cerastium arvense</i>	1431
<i>Cerastium arvense</i> subsp. <i>arvense</i>	1432
<i>Cerastium fontanum</i> agg.	1449
<i>Cerastium caespitosum</i>	21178
<i>Cerastium fontanum</i>	1450
<i>Cerastium fontanum</i> agg.	1449
<i>Cerastium fontanum</i> subsp. <i>triviale</i>	21187
<i>Cerastium holosteoides</i>	1451
<i>Cerastium triviale</i>	25269
<i>Cerastium vulgare</i>	21213
<i>Cerastium pumilum</i> agg.	1460
<i>Cerastium glutinosum</i>	1461
<i>Cerastium pallens</i>	21198
<i>Cerastium pumilum</i>	1462
<i>Cerastium pumilum</i> agg.	1460
<i>Ceratocarpus claviculata</i>	21221
<i>Ceratocarpus claviculata</i>	21221
<i>Corydalis claviculata</i>	1670
<i>Cerintho glabra</i>	1473
<i>Cerintho alpina</i>	21227
<i>Chaerophyllum hirsutum</i>	26947
<i>Chaerophyllum hirsutum</i>	26947
<i>Chaerophyllum hirsutum</i> agg.	1490
<i>Chaerophyllum villarsii</i>	1493
<i>Chamaecytisus ratisbonensis</i>	1504
<i>Chamaecytisus ratisbonensis</i>	1504
<i>Cytisus ratisbonensis</i>	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
Empetrum nigrum agg.	2103
Empetrum nigrum	2105
Empetrum nigrum agg.	2103
Epilobium angustifolium	2113
Chamaenerion angustifolium	21237
Epilobium angustifolium	2113
Epilobium ciliatum	21642
Epilobium adenocaulon	2109
Epilobium ciliatum	21642
Epilobium tetragonum	2126
Epilobium tetragonum	2126
Epilobium tetragonum subsp. lamyi	2127
Epilobium tetragonum subsp. tetragonum	2128
Epipactis atrorubens	2130
Epipactis atropurpurea	21653
Epipactis atrorubens	2130
Epipactis rubiginosa	21664
Epipactis helleborine agg.	2131
Epipactis helleborine	2134
Epipactis latifolia	21660
Equisetum fluviatile	2143
Equisetum fluviatile	2143
Equisetum limosum	21674
Equisetum × mildeanum	91305
Equisetum pratense × sylvaticum	91302
Erica carnea	21680
Erica carnea	21680
Erica herbacea	2163
Erigeron acris	2167
Erigeron acris	2167
Erigeron acris subsp. acris	2168
Erigeron annuus	2178
Erigeron annuus	2178
Erigeron strigosus	21695
Erigeron glabratus	21689
Erigeron glabratus	21689
Erigeron polymorphus	2186
Erodium cicutarium agg.	2197
Erodium cicutarium	2199
Erodium cicutarium agg.	2197
Erophila verna	12356
Draba verna	21586
Erophila verna	12356
Erophila verna agg.	2205
Erophila verna subsp. verna	21715

<i>Erysimum maschallianum</i>	2229
<i>Erysimum durum</i>	21726
<i>Erysimum odoratum</i>	2234
<i>Erysimum erysimoides</i>	21727
<i>Erysimum odoratum</i>	2234
<i>Euphorbia verrucosa</i>	2309
<i>Euphorbia brittingeri</i>	21740
<i>Euphorbia verrucosa</i>	2309
<i>Euphrasia officinalis</i>	13816
<i>Euphrasia officinalis</i>	13816
<i>Euphrasia officinalis</i> subsp. <i>rostkoviana</i>	26254
<i>Euphrasia rostkoviana</i>	2332
<i>Euphrasia rostkoviana</i> agg.	2329
<i>Fallopia convolvulus</i>	2359
<i>Fallopia convolvulus</i>	2359
<i>Polygonum convolvulus</i>	23228
<i>Festuca brevipila</i>	26591
<i>Festuca brevipila</i>	26591
<i>Festuca duriuscula</i>	21820
<i>Festuca trachyphylla</i>	2406
<i>Festuca filiformis</i>	21824
<i>Festuca capillata</i>	21813
<i>Festuca filiformis</i>	21824
<i>Festuca tenuifolia</i>	2405
<i>Festuca ovina</i> agg.	2385
<i>Festuca guestfalica</i> et <i>ovina</i>	91404
<i>Festuca guestfalica</i>	6483
<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
<i>Festuca violacea</i> agg.	2441

<i>Festuca norica</i>	2443
<i>Festuca violacea</i> agg.	2441
<i>Filipendula vulgaris</i>	2462
<i>Filipendula hexapetala</i>	21900
<i>Filipendula vulgaris</i>	2462
<i>Frangula alnus</i>	2472
<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
<i>Galeopsis bifida</i>	2527
<i>Galeopsis tetrahit</i>	2528
<i>Galeopsis tetrahit</i> agg.	2526
<i>Galium aparine</i> agg.	2532
<i>Galium aparine</i>	2533
<i>Galium aparine</i> agg.	2532
<i>Galium spurium</i>	2534
<i>Galium glaucum</i>	2542
<i>Asperula glauca</i>	20637
<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

<i>Gentianella germanica</i> agg.	2657
<i>Gentianella germanica</i> subsp. <i>germanica</i>	7352
<i>Gentianella lutescens</i>	2665
<i>Geum</i> × <i>intermedium</i>	50040
<i>Geum rivale</i> × <i>urbanum</i>	91547
<i>Glechoma hederacea</i> agg.	2710
<i>Glechoma hederacea</i>	2711
<i>Glechoma hederacea</i> agg.	2710
<i>Globularia punctata</i>	2718
<i>Globularia bisnagarica</i>	2718
<i>Globularia elongata</i>	22079
<i>Globularia punctata</i>	2718
<i>Globularia vulgaris</i>	26117
<i>Globularia willkommii</i>	22080
<i>Glyceria fluitans</i> agg.	2719
<i>Glyceria declinata</i>	2720
<i>Glyceria fluitans</i>	2721
<i>Glyceria fluitans</i> agg.	2719
<i>Glyceria notata</i>	26260
<i>Helianthemum nummularium</i>	26596
<i>Helianthemum nummularium</i>	26596
<i>Helianthemum nummularium</i> agg.	2774
<i>Helianthemum nummularium</i> subsp. <i>obscurum</i>	22127
<i>Helianthemum nummularium</i> subsp. <i>ovatum</i>	22128
<i>Helianthemum ovatum</i>	2780
<i>Helictotrichon pratense</i>	20728
<i>Avena pratensis</i>	20717
<i>Avenochloa pratensis</i>	788
<i>Avenula pratensis</i>	20732
<i>Helictotrichon pratense</i>	20728
<i>Helictotrichon pubescens</i>	20729
<i>Avena pubescens</i>	20718
<i>Avenochloa pubescens</i>	789
<i>Avenula pubescens</i>	20733
<i>Helictotrichon pubescens</i>	20729
<i>Helictotrichon versicolor</i>	20730
<i>Avenula versicolor</i>	20734
<i>Hepatica nobilis</i>	2815
<i>Anemone hepatica</i>	20422
<i>Hepatica nobilis</i>	2815
<i>Hepatica triloba</i>	10391
<i>Herniaria glabra</i>	2832
<i>Herniaria glabra</i>	2832
<i>Herniaria glabra</i> subsp. <i>glabra</i>	2833
<i>Hieracium angustifolium</i>	25621
<i>Hieracium glaciale</i>	2885
<i>Hieracium caespitosum</i>	2866
<i>Pilosella caespitosa</i>	12173
<i>Hieracium lactucella</i>	2899
<i>Hieracium auricula</i>	2857
<i>Hieracium lactucella</i>	2899
<i>Pilosella lactucella</i>	12147
<i>Hieracium murorum</i>	25659
<i>Hieracium murorum</i>	25659
<i>Hieracium sylvaticum</i>	2942
<i>Hieracium pilosella</i>	2923
<i>Hieracium pilosella</i>	2923
<i>Pilosella officinarum</i>	14992
<i>Hieracium piloselloides</i>	2924
<i>Hieracium piloselloides</i>	2924
<i>Pilosella piloselloides</i>	12226
<i>Hieracium rothianum</i>	25654
<i>Hieracium setigerum</i>	12219

Hieracium subramosum	10562
depr. Hieracium subramosum	94848
Hippocrepis emerus	21379
Coronilla emerus	1655
Hornungia petraea	2993
Hornungia petraea	2993
Hutchinsia petraea	22188
Hypericum maculatum agg.	3027
Hypericum × 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
Jasione perennis	22240
Juncus alpinus	22243
Juncus alpinoarticulatus	91853
Juncus alpinus	22243
Juncus articulatus	3136
Juncus articulatus	3136
Juncus supinus	22278
Juncus bufonius agg.	3140
Juncus bufonius	3141
Juncus bufonius agg.	3140
Juncus compressus agg.	3147
Juncus compressus	3148
Juncus gerardii	3149
Juncus trifidus	26603
Juncus monanthos	3165
Juncus trifidus subsp. monanthos	22281
Juniperus communis	3168
Juniperus communis	3168
Juniperus communis subsp. communis	3170
Kobresia myosuroides	22299
Elyna myosuroides	2102
Kobresia myosuroides	22299
Koeleria pyramidata agg.	3233
Koeleria	61398
Koeleria cristata	22305
Koeleria gracilis	22312
Koeleria macrantha	3235
Koeleria pyramidata	3236
Koeleria pyramidata agg.	3233
Lamium galeobdolon agg.	22337
Galeobdolon argentatum	21942
Galeobdolon luteum	20026
Galeobdolon luteum agg.	91498
Galeobdolon montanum	20027
Lamiastrum galeobdolon	3256
Lamiastrum montanum	3257
Lamium argentatum	24905
Lamium galeobdolon	22338
Lamium galeobdolon agg.	22337
Lamium montanum	22340
Larix decidua	3272

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

<i>Silene vulgaris</i> var. <i>humilis</i>	24046
<i>Soldanella alpicola</i>	24100
<i>Soldanella pusilla</i> s. l.	5678
<i>Solidago virgaurea</i>	5682
<i>Solidago virgaurea</i>	5682
<i>Solidago virgaurea</i> subsp. <i>virgaurea</i>	5684
<i>Sonchus asper</i>	5690
<i>Sonchus asper</i>	5690
<i>Sonchus asper</i> subsp. <i>asper</i>	5691
<i>Sorbus aria</i> agg.	5696
<i>Sorbus aria</i>	5697
<i>Sorbus aria</i> agg.	5696
<i>Sorbus aucuparia</i>	5700
<i>Sorbus aucuparia</i>	5700
<i>Sorbus aucuparia</i> subsp. <i>aucuparia</i>	5701
<i>Spergula pentandra</i> agg.	5730
<i>Spergula morisonii</i>	5731
<i>Spergula vernalis</i>	24154
<i>Spergularia media</i>	5734
<i>Spergularia maritima</i>	24145
<i>Spergularia media</i>	5734
<i>Stellaria alsine</i>	5769
<i>Stellaria alsine</i>	5769
<i>Stellaria uliginosa</i>	5782
<i>Stellaria aquatica</i>	24917
<i>Myosoton aquaticum</i>	3805
<i>Stellaria aquatica</i>	24917
<i>Stellaria media</i> agg.	5774
<i>Stellaria media</i>	5775
<i>Stellaria media</i> agg.	5774
<i>Stellaria pallida</i>	5777
<i>Stellaria nemorum</i>	5778
<i>Stellaria nemorum</i>	5778
<i>Stellaria nemorum</i> subsp. <i>nemorum</i>	5780
<i>Stellaria palustris</i>	11573
<i>Stellaria glauca</i>	24184
<i>Stellaria palustris</i>	11573
<i>Stipa calamagrostis</i>	24197
<i>Achnatherum calamagrostis</i>	47
<i>Stipa pennata</i> agg.	5787
<i>Stipa joannis</i>	5797
<i>Stipa pennata</i>	24203
<i>Stipa pennata</i> var. <i>mediterranea</i>	13411
<i>Stipa pulcherrima</i>	13746
<i>Symphytum officinale</i>	26629
<i>Symphytum officinale</i>	26629
<i>Symphytum officinale</i> agg.	5823
<i>Tanacetum corymbosum</i> agg.	5841
<i>Chrysanthemum corymbosum</i>	21294
<i>Tanacetum corymbosum</i>	5843
<i>Tanacetum parthenium</i>	5845
<i>Chrysanthemum parthenium</i>	21315
<i>Tanacetum parthenium</i>	5845
<i>Tanacetum vulgare</i>	5846
<i>Chrysanthemum vulgare</i>	21314
<i>Tanacetum vulgare</i>	5846
<i>Taraxacum</i> sect. <i>Alpina et Hamata et Ruderalia</i>	93219
<i>Taraxacum</i> sect. <i>Alpina</i>	7424
<i>Taraxacum officinale</i> agg.	7442
<i>Taraxacum</i> sect. <i>Alpina et Hamata et Ruderalia</i>	93219
<i>Taraxacum</i> sect. <i>Ruderalia</i>	7434
<i>Taraxacum officinale</i>	14513
<i>Taraxacum</i> sect. <i>Erythrosperma</i>	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
Tephrosieris helenitis	23949
Senecio helenitis	5482
Tephrosieris helenitis	23949
Tephrosieris integrifolia	23953
Senecio integrifolius	5492
Tephrosieris 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

<i>Vicia tenuissima</i>	6340
<i>Vicia tetrasperma</i>	6341
<i>Vicia tetrasperma</i> agg.	6338
<i>Vincetoxicum hirundinaria</i> agg.	6349
<i>Cynanchum vincetoxicum</i>	21465
<i>Vincetoxicum hirundinaria</i>	6351
<i>Vincetoxicum officinale</i>	24536
<i>Viola canina</i> agg.	24994
<i>Viola canina</i>	6367
<i>Viola canina</i> subsp. <i>canina</i>	6368
<i>Viola persicifolia</i>	6386
<i>Viola persicifolia</i>	6386
<i>Viola stagnina</i>	6394
<i>Viola silvatica</i> agg.	94746
<i>Viola</i> × <i>bavarica</i>	7420
<i>Viola reichenbachiana</i>	6390
<i>Viola reichenbachiana</i> × <i>riviniana</i>	93487
<i>Viola riviniana</i>	6391
<i>Viola silvatica</i>	24559
<i>Viola tricolor</i> agg.	6397
<i>Viola arvensis</i>	6398
<i>Viola arvensis</i> × <i>tricolor</i>	93457
<i>Viola arvensis</i> subsp. <i>arvensis</i>	7208
<i>Viola tricolor</i>	6402
<i>Viola tricolor</i> subsp. <i>tricolor</i>	6405
<i>Viola tricolor</i> var. <i>arvensis</i>	12796
x <i>Festulolium krasanii</i>	93548
<i>Festuca arundinacea</i> × <i>Lolium multiflorum</i>	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	<i>Euphorbia stricta</i>	<i>Euphrasia stricta</i>	
29	Peppler-Lisbach et al. (2020)	B_S69	13	<i>Polytrichum</i>	<i>Polytrichum commune</i>	
32	Peppler-Lisbach et al. (2020)	B_S70	14	<i>Polytrichum</i>	<i>Polytrichum commune</i>	<i>Polytrichum formosum</i>
32	Peppler-Lisbach et al. (2020)	B_S82	19	<i>Polytrichum</i>	<i>Polytrichum formosum</i>	
32	Raehse (2001)	M546/50	880	<i>Fragaria</i>	<i>Fragaria vesca</i>	
44	Schmidt et al. (unpubl.)	Hünstollen_KF1_37	1825	<i>Anemone</i>	<i>Anemone nemorosa</i>	
44	Schmidt et al. (unpubl.)	Hünstollen_KF1_40	1828	<i>Anemone</i>	<i>Anemone nemorosa</i>	
44	Schmidt et al. (unpubl.)	Hünstollen_KF1_41	1829	<i>Anemone</i>	<i>Anemone nemorosa</i>	<i>Anemone ranunculoides</i>
36	Schmidt et al. (unpubl.)	Hünstollen_KF1_42	1830	<i>Anemone</i>	<i>Anemone nemorosa</i>	<i>Anemone ranunculoides</i>
33	Schmidt et al. (unpubl.)	Hünstollen_KF1_43	1831	<i>Anemone</i>	<i>Anemone nemorosa</i>	
33	Schmidt et al. (unpubl.)	Hünstollen_KF1_44	1832	<i>Anemone</i>	<i>Anemone nemorosa</i>	
33	Schmidt et al. (unpubl.)	Hünstollen_KF1_45	1833	<i>Anemone</i>	<i>Anemone nemorosa</i>	
33	Schmidt et al. (unpubl.)	Hünstollen_KF1_46	1834	<i>Anemone</i>	<i>Anemone nemorosa</i>	
33	Schmidt et al. (unpubl.)	Hünstollen_KF1_47	1835	<i>Anemone</i>	<i>Anemone nemorosa</i>	
33	Schmidt et al. (unpubl.)	Hünstollen_KF1_48	1836	<i>Anemone</i>	<i>Anemone nemorosa</i>	<i>Anemone ranunculoides</i>
33	Schmidt et al. (unpubl.)	Hünstollen_KF1_49	1837	<i>Anemone</i>	<i>Anemone nemorosa</i>	
33	Schmidt et al. (unpubl.)	Hünstollen_KF1_50	1838	<i>Anemone</i>	<i>Anemone nemorosa</i>	
33	Schmidt et al. (unpubl.)	Hünstollen_KF1_51	1839	<i>Anemone</i>	<i>Anemone nemorosa</i>	
33	Schmidt et al. (unpubl.)	Hünstollen_KF2_30	1869	<i>Anemone</i>	<i>Anemone nemorosa</i>	<i>Anemone ranunculoides</i>
33	Schmidt et al. (unpubl.)	Hünstollen_KF2_32	1871	<i>Anemone</i>	<i>Anemone nemorosa</i>	<i>Anemone ranunculoides</i>
33	Schmidt et al. (unpubl.)	Hünstollen_KF2_34	1873	<i>Anemone</i>	<i>Anemone nemorosa</i>	<i>Anemone ranunculoides</i>
33	Schmidt et al. (unpubl.)	Hünstollen_KF2_35	1874	<i>Anemone</i>	<i>Anemone nemorosa</i>	<i>Anemone ranunculoides</i>
33	Schmidt et al. (unpubl.)	Hünstollen_KF2_37	1876	<i>Anemone</i>	<i>Anemone nemorosa</i>	<i>Anemone ranunculoides</i>
33	Schmidt et al. (unpubl.)	Hünstollen_KF2_41	1880	<i>Anemone</i>	<i>Anemone nemorosa</i>	
33	Schmidt et al. (unpubl.)	Hünstollen_KF2_42	1881	<i>Anemone</i>	<i>Anemone nemorosa</i>	

	Schmidt et al.				Anemone nemorosa
33	(unpubl.)	Hünstollen_KF2_43	1882	Anemone	Anemone nemorosa
	Schmidt et al.				Anemone nemorosa
33	(unpubl.)	Hünstollen_KF2_44	1883	Anemone	Anemone nemorosa
	Stroh			Tortella tortuosa	Tortella inclinata
33	(2013)	DBF_11	55		
	Strubelt & Zacharias				Campanula trachelium
33	(2015)	8	41	Campanula	
33					
33					
46					
47					