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Cultural Landscape as Both a Threat and an Opportunity to Preserve a High Conservation Value of Vascular Flora: A Case Study

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Abstract: This study aimed to show the influence of cultural landscape structure on species richnessand the conservation value of vascular flora.The analyses are based on 3201 original floristic lists (relevés) and 83,875 floristic data collected since 1994 within Gopło Millennium Park (Nadgoplański Park Tysiąclecia) in a rural area in central Poland. Descriptions of landscape composition in grid cells (0.5 km × 0.5 km) include land use structure, mean deviation of uneven proportions of various land use types, and Shannon index of diversity (H'). Vascular plant diversity was described using total species richness and contributions of groups of native and alien species. Assessment of floristic conservation value was based on qualitative and quantitative floristic index (*Wfj* and *Wfi*), mean coefficient of conservatism (*C*), and floristic quality index (*FQI*). Floristic analyses were conducted in relation to the whole study area and within grid cells, basing on numbers of species and number of floristic data. The results suggest that species richness in grid cells depends more strongly on diversity and evenness of contributions of land use types, irrespective of which land use types were present. Species richness is strongly dependent on land use structure. Larger contributions of arable fields and built-up areas are linked with a decrease in species richness of nonsynanthropic native plants and species of floristic conservation value. Regularity in this respect is very well illustrated by indices excluding the influence of species richness on floristic value (quantitative floristic index *Wfi* and mean coefficient of conservatism *C*). According to the algorithm of *FQI*, the most valuable floras are characterized by a large number of species with a high contribution of conservative ones. In the study area, this condition was met by floras of surface waters and wetlands.

Keywords: cultural landscape; land cover structure; land use structure; flora; species richness; biodiversity; conservation value; natural resource management

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1. Introduction

At early stages of civilization, all forms of human impact on the natural environment were selective, spatially limited, and did not affect its potential for regeneration. Currently, however, the use of natural resources is a decisive factor influencing landscape structure and determining the possibility of existence of plant species and communities [1]. Changes in land use structure, generating transformations of landscape elements, will be key factors of global biodiversity change by the year 2100 [2].

Relations concerning landscape structure, habitat preferences, and species richness have been studied by many researchers [3]. So far, studies have concerned, primarily, effects of farming on patterns of plant species richness in relation to a broad spectrum of patchy rural cultural landscape [4–8] or some of its elements, e.g., meadows and pastures [9–12], linear marginal habitats or forest islands in the agricultural landscape [13–16], and aquatic habitats located between fields [17]. The spatial scope of analyses varies widely: from the continental scale [18] to a local one, limited to small areas [19–21]. In some studies, special attention was paid to relations between alien species richness and structure of land use

(land cover) [22–24]. Attempts were also made to predict species richness changes in time and space in relation to landscape structure metrics [24,25]. In addition, dynamic progress has been made in studies aimed to quantify biodiversity in relation to function, i.e., indicate the value and range of those features of species that affect ecosystem function [1,26–31].

In accordance with the *Council of Europe Landscape Convention* [32], Poland (similar toother EU countries) has undertaken integrated actions to protect landscape [33,34]. This applies primarily to protected areas, including landscape parks, where landscape (also cultural landscape) is protected with its biodiversity and cultural heritage [35]. Gopło Millennium Park is one of the first landscape parks in Poland where the influence of the landscape mosaic on vascular flora has been investigated. The conducted field and laboratory research aimed (1) to analyse land use structure and flora of vascular plants in relation to the whole park and the grid cells, (2) to define relations between landscape structure and the overall plant species richness and species richness of groups differing in origin status, and (3) to diagnose the influence of land use types on the conservation value of flora.

2. Materials and Methods

2.1. Study Area

The study area is located in central Poland, in the mesoregion of Gniezno Lakeland (PojezierzeGnieźnieńskie) [36], within landscape park Gopło Millennium Park (Nadgoplański Park Tysiąclecia, 52°32′–52°36′ N, 18°19′–18°22′ E), which protects Lake Gopło and the neighbouring ecosystems (covers about 130.5 km^2). The lake and the upper section of the river Noteć are the major hydrological parts of a postglacial tunnel valley.

Documented traces of prehistoric human presence near Lake Gopło date back to the Neolithic period. At that time, human settlements were located mostly on already deforested, fertile soils, known now as 'Kuyavian black earths' [37,38]. In the late Middle Ages, Gopło was naturally connected with the Vistula and Warta, and its water level was 6m higher than currently [39]. Regulation works carried out in the upper Noteć valley in the 19th century contributed to substantial changes in morphometric features of the lake, decline of wetlands, drying of meadows, and even their transformation into arable fields. In large spaces, farming practices have accelerated the processes of peat decomposition and erosion [40].

Despite human impact since the Neolithic period, valuable ecosystems have been preserved near Lake Gopło. They are protected as a landscape protection area, a nature reserve, a landscape park, and Natura 2000 sites (SOO and OSO). The landscape park (and, earlier, the landscape reserve) was created to protect natural breeding sites of birds, historical values linked with beginnings of the Polish State as well as the natural and cultural landscape of Kuyavia.

Gopło Millennium Park is a good testing ground for research on biodiversity in relation to land use structure. The cultural landscape historically shaped since the beginning of the Piast dynasty (in the 10th century), with its natural richness and monuments of material culture, has been protected since 1967. Very fertile plains of so-called Black Kuyavia (Czarne Kujawy), with 'black earths' developed from exposed lake sediments of Lake Gopło, are the basis for commercial farming. In contrast, in the southern part of the park (shaped by the Vistulian glaciation and characterized by more varied relief and poorer, leached brown soils) subsistence farming prevails. The flora of the park is wellstudied, with a rich database on anthropogenic conditions [41–43].

Gopło Millennium Park was divided into grid cells (0.5 km × 0.5 km) to analyse both land use structure and flora in each grid cell (Figure 1). Within, arable fields dominate. Smaller proportions of its area are covered by surface waters and wetlands as well as by meadows and pastures. Forests occupy a very small proportion (Table 1, Figure 1). Arable fields dominate also in most (65.3%) grid cells, i.e., they cover at least 50% of their area (mean 57.2%) (Table 2, Figure 2).

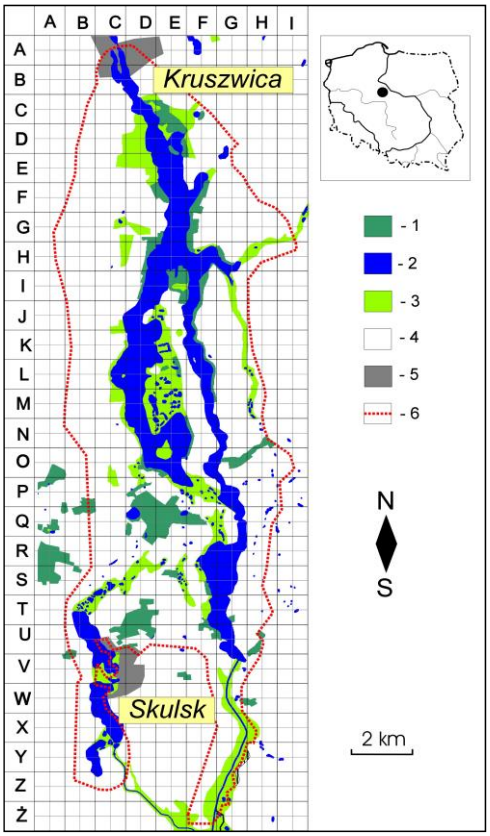


Figure 1. Map of Gopło Millennium Park, with grid cells (0.5 km × 0.5 km) and land use types: 1—forests; 2—surface waters and wetlands; 3—meadows and pastures; 4—arable fields; 5—built-up areas, orchards, and private gardens; 6—border of landscape park.

Table 1. Land use structure (original data).

Land Use Type	Covered Area [ha]	Proportion of Total Area [%]
Forests (1)	1035.9	7.4
Surface waters and wetlands (2)	2283.2	16.3
Meadows and pastures (3)	1418.1	10.1
Arable fields (4)	8026.3	57.3
Built-up areas, orchards, and private gardens (5)	699.3	5.0
Marginal habitats (6)	537.2	3.8
Total	14,000.0	100.0

Table 2. Selected parameters of land use within the grid of grid cells.

Land Use Type	Mean Area Covered		Maximum Area Covered		Number (%) of Grid Cells Where This Land Use Type Covers ≥50% of Cell Area
	[ha]	[%]	[ha]	[%]	
Forests (1)	1.8	7.2	24.9	99.5	16 (2.9%)
Surface waters and wetlands (2)	4.1	16.4	24.9	99.5	110 (19.6%)
Meadows and pastures (3)	2.5	10.0	18.6	74.5	12 (2.1%)
Arable fields (4)	14.3	57.2	25.0	100.0	351 (62.7%)
Built-up areas, orchards, and private gardens (5)	1.2	4.8	24.2	96.8	7 (1.3%)
Marginal habitats (6)	1.0	4.0	20.5	82.0	0 (0.0%)

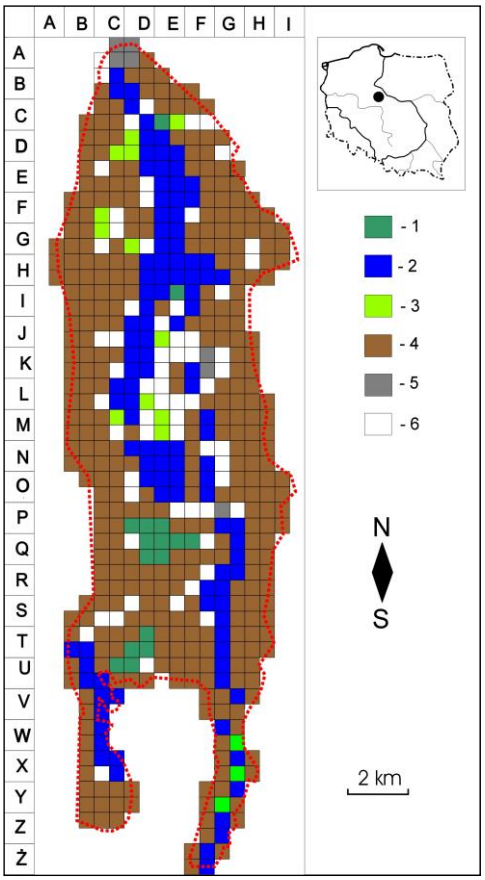


Figure 2. Grid cells with a dominant proportion (≥50%) of land use types: 1—forests; 2—surface waters and wetlands; 3—meadows and pastures; 4—arable fields; 5—built-up areas, orchards, and private gardens; 6—no dominant land use type.

2.2. Floristic Classifications and Indices

To describe the conservation value of flora, usually, contributions of rare and threatened species or habitat specialists are used. There are also some known examples of synthetic use of several characteristics of species to determine the floristic value of a study area [44,45]. One possibility is the concept of multivariate evaluation (valorization). It assumes that natural and anthropogenic factors influence, e.g., frequency of occurrence, spectrum of occupied habitats, distribution range, and threat status of species. Thus, each species carries partial information about the conservation value of the flora of the study area, reflected, e.g., in contributions of habitat specialists or species that are very rare, threatened at the regional or national scale, or reach their range limit [46]. This approach takes into account the origin status, frequency, threat category, chorological aspect, and significance of local species resources. Species conservation value (w) was calculated by summing up the partial results (valorization indices) presented in Table 3.

The floristic value of individual grid cells was determined in 2 ways, using the following formulas:

$$Wfj = \Sigma\, w/N \text{ and } Wfi = \Sigma\, (w \cdot n)/N_n$$

where *Wfj*—floristic value of the area calculated on the basis of species richness; *Wfi*—floristic value of the area calculated on the basis of the structure of records; *w*—species value; *n*—sum of records of the species in the grid cell; *N*—number of species in the grid cell; N_n—total number of the floristic data (i.e., records of individual species)collected in the study area.

Table 3. Principles of assessment of species conservation value (*w*), after Chmiel (2006) [46].

Criterion and Group		Value of Valorization Index
Origin status (defined in Table 4)	Nn	10
	Ns	8
	Ap	6
	Ar	4
	Kn	0
	D	0
Frequency class (defined in Table 5)	I	8
	II	7
	III	6
	IV	5
	V	4
	VI	3
	VII	2
	VIII	1
Local threat category (defined in Table 6)	CR	10
	EN	8
	VU	6
	NT	4
	LC	2
Significance of local resources (defined in Table 7)	in Wielkopolska and Kujawy region	5
Chorological aspect (defined in Table 8)	isolated localities; absolute or regional limit of distribution within or close to study area	5

To describe the conservation value of flora, also, the concept of Floristic Quality Assessment (*FQA*) was used [47,48]. Its essence is an expert evaluation of the coefficient of conservatism (*c*), i.e., association of the species with habitats that were not transformed by human impact, on a scale of 1–10. By summing up *c* values of species present in the given area and dividing it by species number (*n*), the mean coefficient of conservatism (*C*) for the flora of the study area was estimated:

$$C = \sum c/n$$

Floristic quality index (*FQI*) was calculated by multiplying the mean value (*C*) by the grid cell root of the number of species ($\sqrt{n}$).

$$FQI = C \times \sqrt{n}$$

The concept of *FQA* has been widely applied in North America [49–60]. The criteria and groups listed in Table 1, used to describe the conservation value of the total flora and floras of individual grid cells, are defined in Tables 4–8.

Table 4. Classification and definitions of groups of species differing in origin status and naturalization, after Chmiel (2006) [46], Jackowiak (1990) [61], and Thellung (1915) [62].

Floristic Group Based on Origin Status	Short Description
Native species: Nonsynanthropic native species (Nn)	native species growing exclusively or nearly exclusively in natural, undisturbed habitats
SSemi-synanthropic native species (Ns)	native species growing also in semi-natural and rarely in anthropogenic habitats
Synanthropic native species (apophytes) (Ap)	native species growing exclusively or nearly exclusively in semi-natural and anthropogenic habitats
Alien species:	
Archaeophytes (Ar)	species that, thanks to human impact, appeared spontaneously in Central Europe before discovery of America (in 1492)
Kenophytes (Kn)	species that, thanks to human impact, appeared spontaneously in Central Europe after discovery of America
Diaphytes (D)	alien species appearing spontaneously only in some periods or temporarily escaping from cultivation

Table 5. Frequency classes of species, after Chmiel (2006) [46].

Frequency Class	Class Description	% of Occupied Grid Cells	Number of Occupied Grid Cells
I	very rare	<0.51	<3
II	rare	0.51–2.00	3–11
III	infrequent	2.01–5.00	12–28
IV	widely distributed	5.01–10.00	29–56
V	moderately frequent	10.01–20.00	57–112
VI	frequent	20.01–35.00	113–196
VII	common	35.01–50.00	197–280
VIII	very common	>50.00	>280

Table 6. Classification and definition of local threat categories, after IUCN 2021 [63].

Threat Category	Short Description
Critically endangered (CR)	extremely high risk of extinction (species characterized by a narrow scale of habitats and plant communities; a low number of small, declining populations)
Endangered (EN)	not close to extinction, but very likely to become critically endangered in near future
Vulnerable (VU)	not classified as CR or EN, although its resources are deteriorating (range fragmentation, isolation of populations, decreasing size and number of populations)
Near threatened (NT)	not threatened, but considering changes in its resources and environment in situ, it is likely to be threatened in near future
Least concern (LC)	size of its range and its resources in study area relatively stable; may be of interest because of its decline in neighbouring regions

Table 7. Significance of local resources of individual species, after Chmiel (2006) [46]; diagnoses based on the *Atlas of Distribution of Vascular Plants in Poland* [64] and expert knowledge.

Local Resources	Short Description
Significant in study area	density of localities of a given species within study area distinguished from its distribution in Wielkopolska (W) and Cuyavia (K)

Table 8. Chorological aspect, after Chmiel (2006) [46]; diagnoses based on the *Atlas of Distribution of Vascular Plants in Poland* [64] and expert knowledge.

Chorological Aspect	Short Description
Location in relation to continuous range of distribution	localities of species within study area either situated in isolated localities (I) or reaching an absolute/regional limit of distribution within study area (or close to it) (N, NE, E, SE, S, SW, W, or NW)

2.3. Indices of Landscape Heterogeneity

In spatial analyses, six major land use types in the cultural landscape were taken into account: (1) forests; (2) surface waters and wetlands; (3) meadows and pastures; (4) marginal habitats: roadsides, grassy field borders, and small mid-field woodlots; (5) arable fields; and (6) built-up areas, orchards, and private gardens. Land use type takes into account only marginal habitats that are not used for agriculture and are landscape components located in a mosaic of arable fields or meadows. They are either linear (grassy field borders, ditches and small water courses, roadsides, etc.) or non-linear (small wooded patches, water bodies and marshes, covering less than 0.2 hectare). This land use type excludes similar landscape components located within extensive woodlands, also forest edges.

They were digitized on the basis of orthophotomaps (https://geoserwis.gdos.gov.pl/mapy/) using QGIS 2.0 Dufour software (accessed on 15 November 2020). The covered area and proportion of the total area were determined in relation to the whole study area and each grid cell (0.5 km × 0.5 km).

In every grid cell, landscape heterogeneity was quantified using the Shannon diversity index (H') [65].

Landscape heterogeneity in individual grid cells was also described using mean deviation of proportions of land use types (d), calculated as follows:

$$d = (x - y)/N$$

where x—area covered by one land use type; y—arithmetic mean of areas covered by all land use types (i.e., 16.67% of grid cell area here); N—number of distinguished land use types. In relation to an analysed grid cell, proportions of land use types would be even if all the analysed types covered equal parts of the grid cell, i.e., 4.16 ha each (1/6 = 16.67% of grid cell area), because six land use types were distinguished. Then, the value of (d) would be 0.

2.4. Floristic Database

Basic field research, consisting of complex mapping of vascular flora, was conducted in 1994–1997. In the next 25 years, the area was monitored, and maps of distribution were updated for the most unstable elements of its flora: threatened and invasive species. Floristic diversity and species richness was documented with floristic lists (relevés). Each time, location of the study plots on the grid of 560 grid cells (0.5 km × 0.5 km) was recorded and land use types were defined. Consequently, the total study area covered 140 km^2. Floristic analyses were made in two ways: in relation to the number of species and in relation to sums of floristic data concerning individual species and groups of species in

different land use types. In the whole study period, 3201 floristic lists and 83,875 floristic data (records of individual species) were collected. The dominance of arable fields in the study area was reflected in the largest numbers offloristic lists (1296, i.e., 40.5% of the total number) and floristic data (22,103, i.e., 26.4% of the total number) collected during mapping of the flora of this land use type. Particularly noteworthy, however, is therelatively high number floristic data (Table 9) for marginal habitats in comparison with the small proportion of the total area covered by them (see Table 1).

Table 9. Distribution of floristic lists and floristic data collected within various land use types.

Land Use Type	Number of Relevés	%	Number of Floristic Data	%
Forests (1)	207	6.5	6554	7.8
Surface waters and wetlands (2)	427	13.3	12,144	14.5
Meadows and pastures (3)	371	11.6	13,523	16.1
Arable fields (4)	1296	40.5	22,103	26.4
Built-up areas, orchards, and private gardens (5)	205	6,4	6761	8.1
Marginal habitats (6)	583	18.2	18,924	22.6
Others (7)	112	3.5	3866	4.6
Total	3201	100.0	83,875	100.0

Scientific names of vascular plants in Appendix A follow Mirek et al. (2020) [66]. Information on properties (status) of these species, provided there, is based on my article [46] and my expert knowledge.

In the series of statistical analyses, regression analysis was used. This option is an integral part of Microsoft Excel version 365. The *p*-value index was calculated in the Statistica 13 program.

3. Results

3.1. Species Richness in Relation to Land Use Types

Flora of the park included 867 vascular plant species. Most of them were recorded in marginal habitats (603 species, 69.6% of the total species number). A slightly lower numbers of species was found in meadows and pastures (520, 60.0%), forests (473, 54.6%), as well as surface waters and wetlands (466, 53.7%). The lowest numbers of species were recorded in arable fields (261, 30.1%) and in built-up areas, orchards, and private gardens (392, 45.2%). Only 90 species were shared by all the land use types. Numbers of species shared by two, three, four, and five land use types were as follows: 138, 141, 162, and 125, respectively. However, as many as 211 species were habitat specialists, recorded in only one type of land use. Species richness within individual grid cells increased with growingdiversity of land use types (Figure 3).

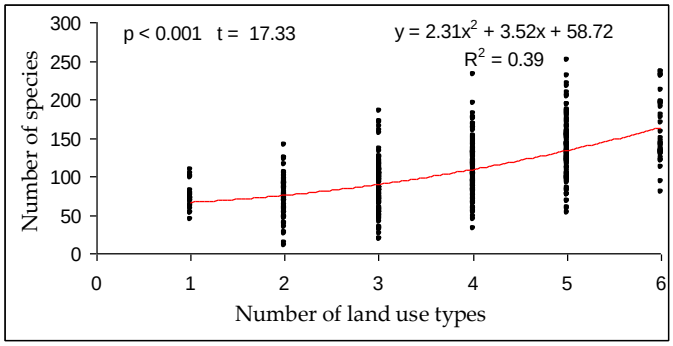


Figure 3. Dependence of plant species richness in grid cellson diversity of land use types.

Species richness tends to be higher in squares with even proportions of various land use types. This condition would be optimally fulfilled if all the analysed land use types covered equal parts of a square, i.e., 4.16 ha each (16.67%). The analysis shows that species richness is negatively correlated with growing values of mean deviation, i.e., increasing areal disproportions of various land use types in grid cells(Figure 4).

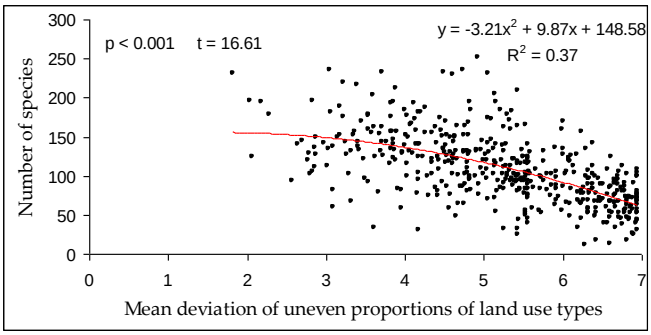


Figure 4. Dependence of plant species richness on mean deviation of uneven proportions of various land use types in grid cells.

In addition, the Shannon index of diversity (*H'*) indicates a dependence of species richness on landscape composition. Growing *H'* values increase the chance of higher species richness in grid cells (Figure 5), but this relationship is weaker (R^2 = 0.19) than for mean deviation of uneven proportions of various land use types (R^2 = 0.37).

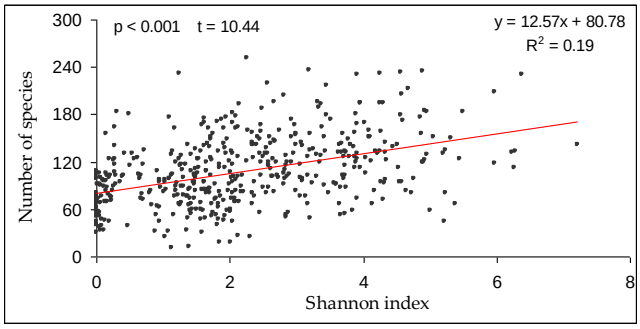
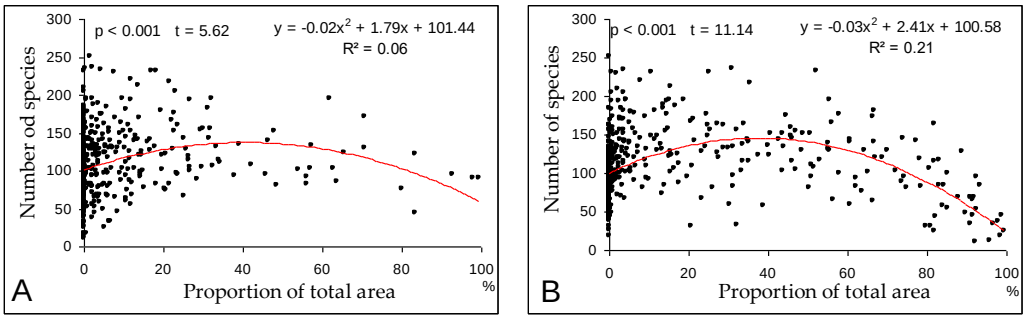


Figure 5. Effect of cultural landscape diversity, expressed by the Shannon index of diversity (*H'*), on plant species richness in grid cells.

Maximum proportions of individual land use types (resulting from the situation when one type clearly dominates) always had a negative influence on floristic richness in grid cells (Figure 6).



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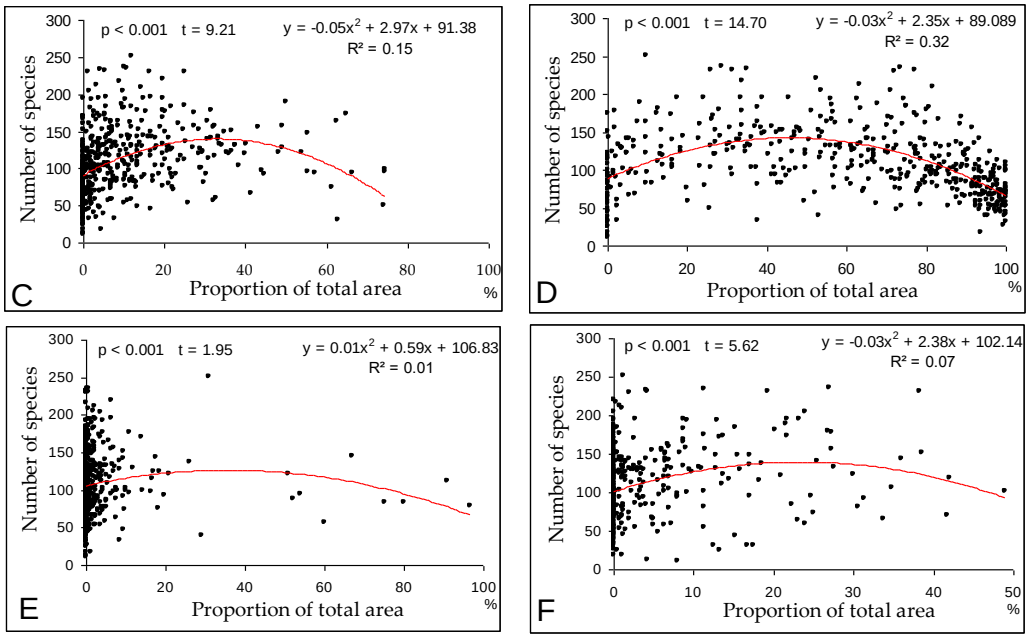


Figure 6. Dependence of plant species richness on proportions of land use types in grid cells: (**A**)—forests; (**B**)—surface waters and wetlands; (**C**)—meadows and pastures; (**D**)—arable fields; (**E**)—built-up areas, orchards, and private gardens; (**F**)—marginal habitats.

3.2. Variation in Percentage Contributions of Species Groups Differing in Origin Status and Naturalization in Relation to Land Use

The flora of Gopło Millennium Park is dominated by native species (645 species, i.e., 74.4% of the total number), while alien plants are represented by 222 species. Very similar proportions are observed in numbers of records: native species account for 74.6% of the total number of floristic data. Among native taxa, species avoiding human impact prevail (Nn and Ns). However, they were recorded less frequently than apophytes (Ap), which are able to colonize anthropogenic habitats (Table 10).

Table 10. Proportions of groups differing in origin status in the total flora, expressed as numbers of species and floristic data.

Land Use Type	Number of Floristic Lists	%	Number of Floristic Data	%
Non/semi-synanthropic native species (Nn, Ns)	374	43.1	20.178	24.1
Apophytes (Ap)	271	31.3	42,990	51.3
Archaeophytes (Ar)	93	10.7	16.796	20.0
Kenophytes (Kn)	60	6.9	3381	4.0
Diaphytes (D)	69	8.0	530	0.6
Total	867	100.0	83,875	100.0

Nonsynanthropic and semi-synanthropic native species were the most numerous and most frequent (Table 11) in aquatic/wetland ecosystems and in forests.

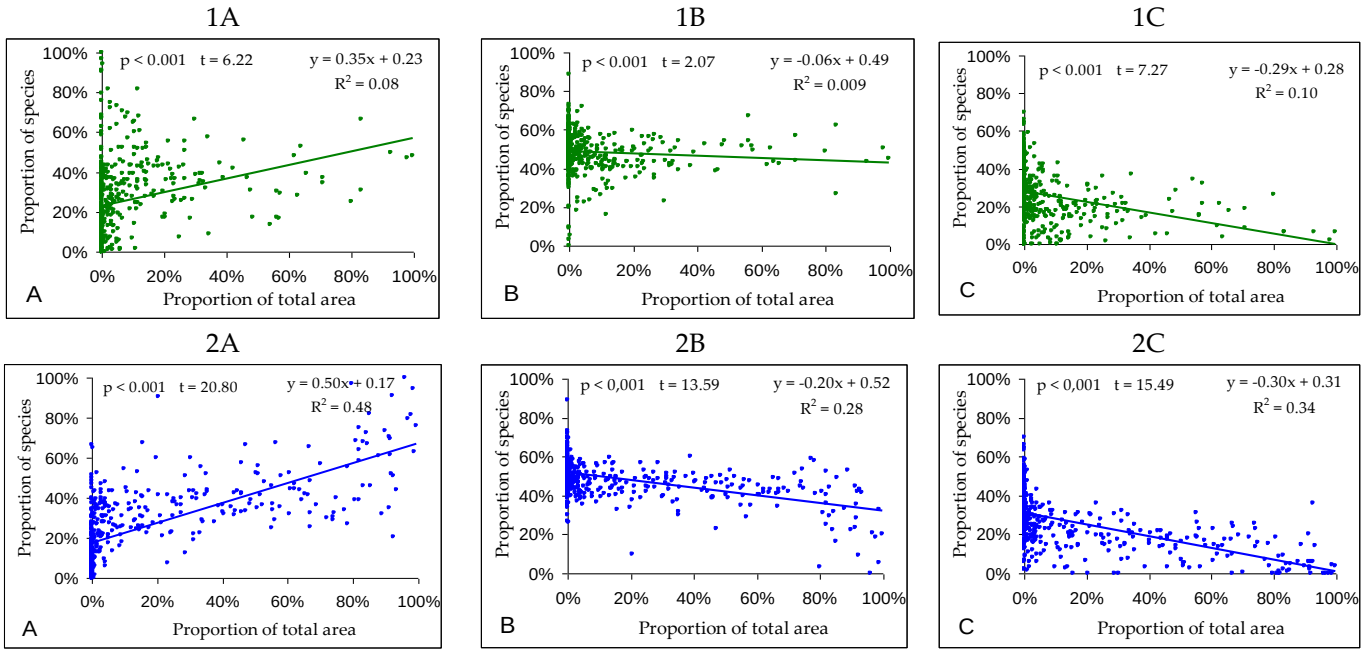
Their contributions to the floras of grid cellsare usually markedly higher when the proportion of aquatic/wetland ecosystems is high (R^2 = 0.48) (Figure 7(2A)). Increased proportions of forests, marginal habitats, as well as meadows and pastures also positively affect native species richness, although less strongly (Figure 7(3A)). Increased proportions of arable fields (R^2 = 0.61) (Figure 7(4A))and, to a lesser extent, of built-up areas, orchards, and gardens (R^2 = 0.02) limit the shares of native species within grid cells (Figure 7(5A)). Species richness and the number of records of apophytes only slightly depend on land use structure (Figure 7(1B–6B)).

Table 11. Geographical-historical structure of floras of the distinguished land use types, expressed as percentage contributions to the total number of species (A) and to the total number of floristic data (B).

Land Use Type	Origin Status of Species					
	Non/Semi-Synanthropic Native Species		Apophytes		Alien Species	
	A [%]	B [%]	A [%]	B [%]	A [%]	B [%]
Forests (1)	50.7	58.8	37.5	37.0	11.8	4.2
Surface waters and wetlands (2)	53.2	71.9	39.1	25.5	7.7	2.6
Meadows and pastures (3)	40.0	28.3	43.8	67.3	16.2	4.3
Arable fields (4)	14.6	0,4	44.8	34.4	40.6	65.2
Built-up areas, orchards, and private gardens (5)	15.8	5.8	44.9	52.2	39.3	42.0
Marginal habitats (6)	36.2	14.5	40.6	73.5	23.2	12.0

Alien species were the most numerous and frequent in arable fields as well as in built-up areas, orchards, and gardens (Table 11). Their contribution to the floras of grid cellstends to increase primarily with growing areal contributions of arable fields (R^2 = 0.53) (Figure 7(4C)).

Species richness of all groups of plants, irrespective of their origin status, is positively affected by a diversity of land use types in grid cells (Figure 8A–C). This dependence is the most conspicuous among apophytes. Species of this group are generally eurytopic, so they can colonize also areas with a diversity of land use types.



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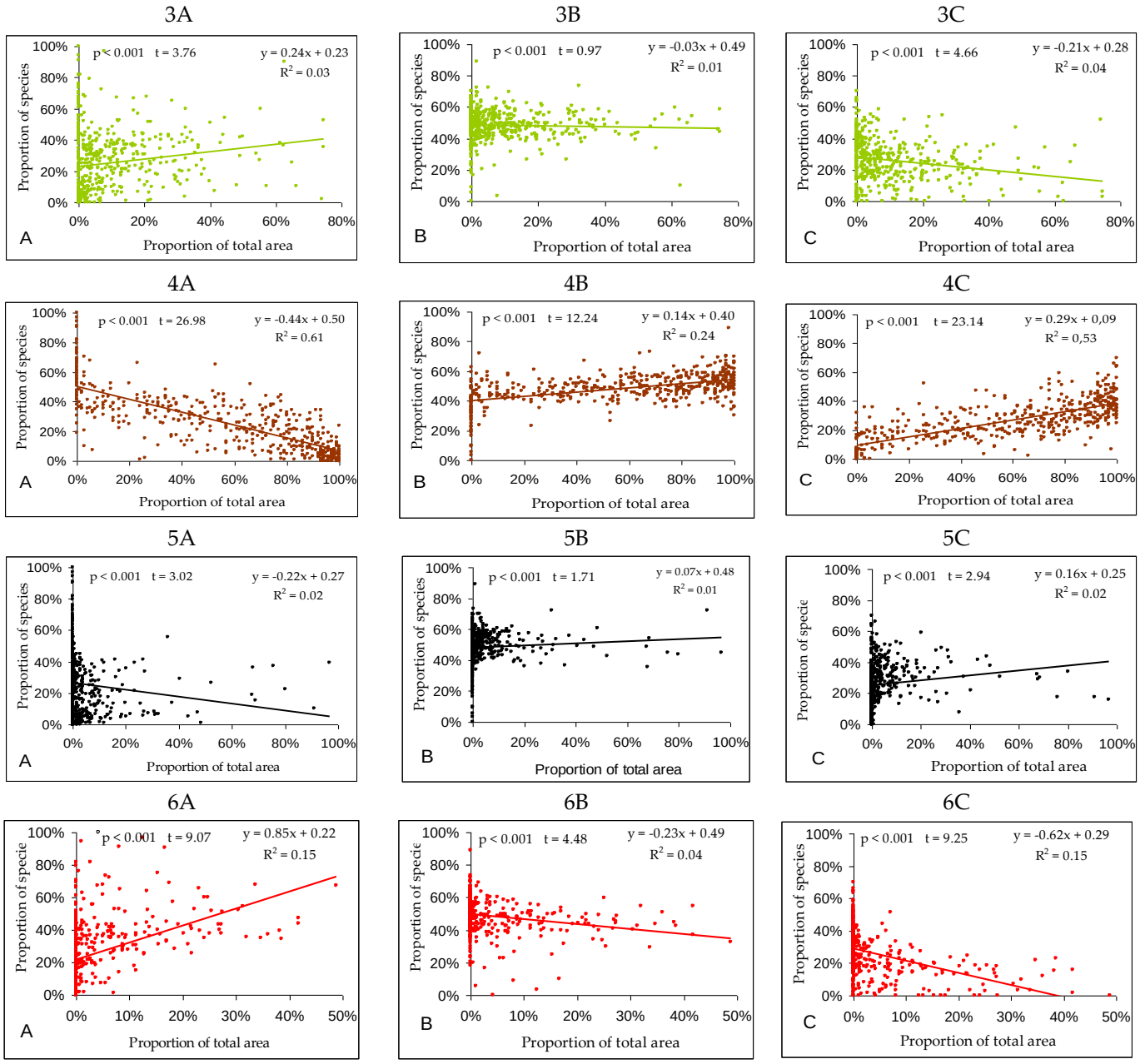

Figure 7. Contributions of non/semi-synanthropic native species (**A**), apophytes (**B**), and alien species (**C**) to floras of grid cells, depending on the proportion of (**1**) forests, (**2**) surface waters and wetlands, (**3**) meadows and pastures, (**4**) arable fields, (**5**) built-up areas, orchards, and private gardens, and (**6**) marginal habitats.

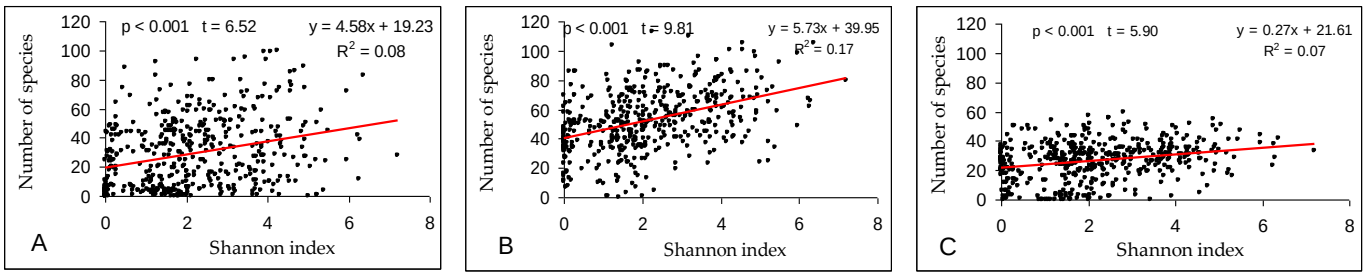

Figure 8. Effect of cultural landscape heterogeneity, expressed by the Shannon index of diversity (*H'*), on numbers of non/semi-synanthropic native species (**A**), apophytes (**B**), and alien species (**C**) in grid cells.

3.3. Floristic Conservation Value of Sites Covered by Various Land Use Types

A comparison of floristic conservation value of forests, waters and wetlands, meadows and pastures, as well as marginal habitats, if based only on species composition, indicates small differences between them (Figure 9A–C). The least valuable floras were observed on ruderal sites (built-up areas) and segetal ones (arable fields). Differences between them are more noticeable when *FQI* is applied. The exclusion of alien species from its algorithm implies lower *FQI* values (according to methodological rules) because aliens account for considerable proportions of segetal and ruderal floras.

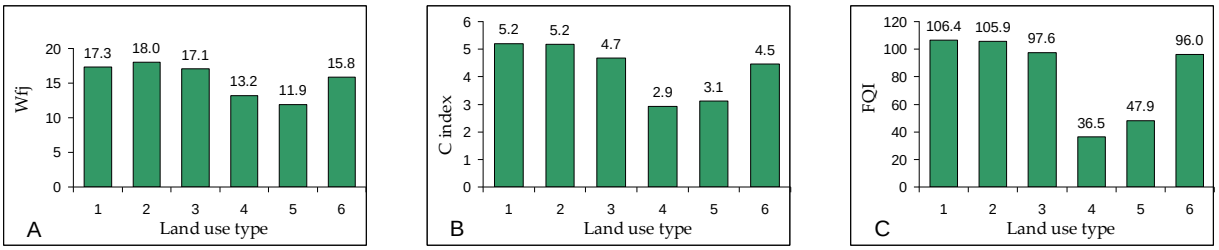

Figure 9. Floristic conservation value, based on species composition, expressed by qualitative floristic index *Wfj* (**A**), mean coefficient of conservatism *C* (**B**), and floristic quality index *FQI* (**C**): 1—forests, 2—surface waters and wetlands, 3—meadows and pastures, 4—arable fields, 5—built-up areas, orchards, and private gardens, and 6—marginal habitats.

When, in the evaluation, floristic data are taken into account, differences in floristic conservation value are more noticeable. All three indices unanimously show that aquatic/wetland flora is characterized by the highest conservation value (Figure 10A–C). When numbers of floristic data are considered, the influence of casual species on final results of floristic conservation value assessment is minimized. Similarly, the influence of rare habitat specialists associated with the evaluated ecosystem is also smaller.

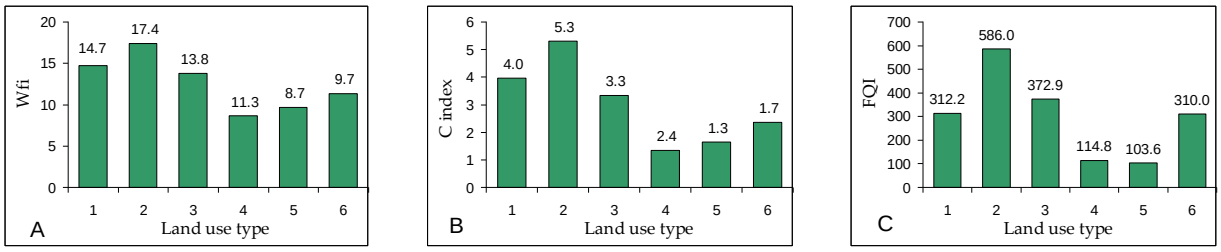

Figure 10. Floristic conservation value based on the structure of floristic data, expressed by quantitative floristic index *Wfi* (**A**), mean coefficient of conservatism *C* (**B**), and floristic quality index *FQI* (**C**): 1—forests, 2—surface waters and wetlands, 3—meadows and pastures, 4—arable fields, 5—built-up areas, orchards, and private gardens, and 6—marginal habitats.

4. Discussion

4.1. Species Richness in Relation to Land Use

More and more attention has been paid recently to protection of cultural landscapes and their biodiversity [67,68].To emphasize the great value of mutual relations between culture and biodiversity, the term biocultural diversity was coined in 2005 [69].

Vascular plant species richness in the study area is unevenly distributed between individual land use types. The largest number of species was recorded in marginal habitats, although they cover the smallest proportion of the study area. The smallest number was recorded in arable fields, which are dominant components of the landscapes surrounding Lake Gopło.

Nevertheless, it would be wrong to conclude that marginal habitats intrinsically contribute to a high floristic richness in the analysed grid cells, because a large number

of plant species found there originate from the neighbouring ecosystems. Admittedly, in homogeneous cultural landscapes, especially in farmlands, they can become localrefugia and ecological corridors facilitating migration (also of segetal species, typical of arable fields). The latter possibility is confirmed by results of research conducted in Sweden, which concerned the influence of linear marginal habitats on floristic richness of research plots [14]. The presence of marginal habitats can slow down the loss of plant species originating from other ecosystems. This effect is enhanced if the area covered by marginal habitats is larger [14]. Similar results have been reported from southern France, where the role of marginal habitats among vineyards and olive groves was studied [70]. The biodiversity of cultural landscape can be strongly affected by even small remaining patches of semi-natural vegetation, scattered among cultivated patches [71]. However, this role of marginal habitats may be less effective if intensive farming is conducted in their immediate vicinity [72]. The negative impact of highly commercial agriculture on biodiversity has already been reported [73,74].

It is commonly believed that commercial forests play a minor role in shaping biodiversity, as compared with natural forests [75]. However, research conducted in artificial forests or plantations shows that species richness of some groups of organisms, also plants, can be greater there than in natural forests [76,77]. Results of this study indicate that expression of species richness in the grid of grid cells is positively influenced by landscape heterogeneity, expressed here as the high number and evenness of proportions of various land use types. The heterogeneity of landscape components ensures a diversity of suitable niches, affecting biotic processes [25], and increases the chances of occurrence of habitat specialists. In Gopło Millennium Park, two processes are equally harmful to biodiversity: extensive farming methods are gradually abandoned, whereas land use is intensified. This phenomenon, observed earlier in West Europe, is currently common also in countries of Central and Eastern Europe [78]. Some authors suggestthat stopping agricultural activity can be a chance for ecosystem restoration or new landscape functions [79].

Out of the two alternative measures of landscape heterogeneity in grid cells, the mean deviation of uneven proportions of land use types (d) more precisely described the dependence of species richness on the landscape mosaic on the grid of cells. Landscape diversity expressed as the Shannon index less precisely reflects the relationship between species richness and landscape heterogeneity.

The influence of land use structure on species richness within individual grid cellsdepends more on the number of land use types than on which land use types are present. In all grid cells, an increasing dominance of any land use type was linked with a decrease in species richness. Such a dominance lowers landscape heterogeneity and thus reduces the availability of suitable habitats. This applies particularly to the dominance of arable fields [80]. In comparison with them, built-up areas, especially cities and towns, seem to be enclaves of local plant species richness [81]. Similar analyses in Europe and the USA indicate that plant species—in contrast to animals—react more strongly to local environmental conditions at the site of their occurrence than to landscape composition [73].

4.2. Percentage Contributions of Species Groups Differing in Origin Status and Naturalization in Relation to Land Use

Similarly to earlier reports [22,23], this study shows that species richness of native and alien plants increases with increasing landscape heterogeneity. However, the rate of species richness growth in those groups in response to growing diversity of land use types is different. In the cultural landscape of Gopło Millennium Park, the species richness of non-synanthropic native plants tends to increase mostly in response to growing contributions of surface waters and wetlands to landscape structure. A significant influence of river ecosystems on native species richness is confirmed, for example, by results of research conducted near Dessau (Germany) [22]. A weaker but also positive relationship is noticeable when the proportion of meadows and pastures is growing. In comparison with marginal habitats, the proportion of forests in grid cells does not affect remarkably the species richness of

nonsynanthropic native plants. Only scanty forests have been preserved in the study area: they usually form small patches, sometimes surrounded by farmlands and are susceptible to the impact of external factors. Some of the smallest wooded patches, composed of a group of trees and/or shrubs surrounded by fields, were classified as marginal habitats.

As expected, and in accordance with earlier research results [22], species richness of nonsynanthropic native plants was declining markedly with increasing contributions of built-up areas, but mostly of arable fields to land use structure within grid cells.

In contrast, for apophytes, it is difficult to notice any unambiguous relationships between plant species richness and landscape structure. Apophytes can be numerously represented within any land use type, also in grid cells with a simplified landscape structure. However, as shown by values of the Shannon index, the increase in apophyte species richness in relation to growing landscape heterogeneity is greater than for nonsynanthropic native species and anthropophytes. This indicates that apophytes more easily colonize a broad range of ecological niches created by the growing diversity of landscape structure. Nonsynanthropic native species and, somewhat unexpectedly, also anthropophytes considerably less efficiently make use of the mosaic of habitats. Anthropophytes include many species that can be classified as habitat specialists, e.g., some segetal and ruderal species.

4.3. Indices of Floristic Conservation Value

This study provides evidence that plant species richness does not correspond to the conservation value of floras of the selected landscape components. Thus, we should not overestimate the usefulness of plant species richness for assessment of floristic conservation value and determination of priorities of environmental protection. This measure is an important component of plant cover description, but only in combination with its other parameters [82].

All the three applied measures of floristic conservation value (*Wfi*, *C*, and *FQI*) from the marginal habitats, which are refugia of the largest number of plant species, are less valuable floristically than surface waters and wetlands, meadows and pastures, and even forests. Indices of floristic conservation value of ruderal and segetal floras were markedly lower. These differences are more conspicuous when *FQI* is applied. The exclusion of alien species from its algorithm implies lower *FQI* values, because aliens account for large proportions of segetal and ruderal floras. The mean coefficient of conservatism (*C*), even in patches of numerous occurrences of species with high coefficients of conservatism (*c*), can be masked by large numbers of adventive species or native species with low coefficients of conservatism (*c*). According to [83], when species richness is high, *FQI* is a more precise measure of floristic conservation value.

Differences in floristic conservation value are more noticeable when numbers of floristic data are taken into account. Then, the primary role of flora of aquatic/wetland habitats in the ranking of conservation value is the most conspicuous. When analyses are based on sums of floristic data, the influence of casual species on final results of floristic conservation value assessment is minimized. However, it similarly diminishes the influence of habitat specialists associated with the evaluated ecosystem, which are usually very rare.

Research on plant species richness and floristic conservation value in relation to components of cultural landscape can be a useful tool for spatial planning and management taking into account environmental, social, and economic aspects [77,84–87].

5. Conclusions

In the cultural landscape dominated by farmlands, plant species richness is determined mostly by the number of various land use types and evenness of their contributions. The contribution of alien species to floras of grid cells is positively related to contributions of agricultural areas and built-up areas to the mosaic of landscape. In contrast, nonsynanthropic native species maximize their contribution in the grid cells where surface waters and wetlands prevail.

All the three applied measures of floristic conservation value indicate that the most valuable plant species are found in landscapes dominated by surface waters and wetlands or meadows and pastures.

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Conflicts of Interest: The author declares no conflict of interest.

Appendix A

Table A1. Alphabetic List of Vascular Plant Species Found in Gopło Millennium Park.

Name of Species	**Species Information**								
1	2	3	4	5	6	7	8	9	10
Acer campestre L.	Ns	LC	NE	-	5	III	19	23	23
Acer negundo L.	Kn	-	-	-	0	IV	43	55	55
Acer platanoides L.	Ap	-	-	-	2	VI	120	135	135
Acer pseudoplatanus L.	Ap	-	-	-	2	V	69	80	80
Achillea millefolium L. s. str.	Ap	-	-	-	1	VIII	446	791	794
Achillea pannonica Scheele.	Ap	-	NE	W	3	II	10	11	12
Acinos arvensis (Lam.) Dandy	Ap	-	-	-	1	III	17	17	17
Acorus calamus L.	Kn	-	-	-	0	V	78	94	94
Actaea spicata L.	Nn	VU	-	-	10	II	7	7	7
Adoxa moschatellina L.	Nn	-	-	-	8	III	18	23	23
Aegopodium podagraria L.	Ns	-	-	-	5	V	64	77	77
Aesculus hippocastanum L.	Kn	-	-	-	0	III	27	30	30
Aethusa cynapium L.	Ar	-	-	-	0	IV	42	44	45
Agrimonia eupatoria L.	Ap	-	-	-	2	IV	37	41	41
Agrimonia procera Wallr.	Ns	NT	-	-	4	III	22	24	24
Agrostemma githago L.	Ar	-	-	-	0	VI	148	183	185
Agrostis canina L. s. str.	Nn	VU	-	-	10	I	1	1	1
Agrostis capillaries L.	Ap	-	-	-	4	V	79	111	111
Agrostis gigantea Roth	Ap	-	-	-	2	VII	218	304	305
Agrostis stolonifera L.	Ap	-	-	-	4	VI	186	245	245
Alisma plantago-aquatica L.	Ns	-	-	-	4	VI	126	150	150
Alliaria petiolata (M. Bieb.) Cavara & Grande	Ap	-	-	-	4	V	61	70	70
Allium angulosum L.	Nn	CR	-	KW	10	II	7	11	11
Allium oleraceum L.	Ap	-	-	-	5	III	14	17	17
Allium vineale L.	Ap	-	-	-	4	V	91	100	100

Table A1. *Cont.*

Name of Species	**Species Information**								
1	2	3	4	5	6	7	8	9	10
Alnus glutinosa (L.) Gaertn.	Ns	-	-	-	4	VII	225	333	334
Alnus incana (L.) Moench	Kn	-	-	-	0	IV	47	62	62
Alopecurus aequalis Sobol.	Ns	-	-	-	6	III	18	18	18
Alopecurus geniculatus L.	Ns	-	-	-	4	III	19	20	20
Alopecurus myosuroides Huds.	Ar	LC	-	-	0	I	2	2	2
Alopecurus pratensis L.	Ap	-	-	-	4	V	86	100	100
Alyssum alyssoides (L.) L.	Ap	-	-	-	3	II	5	6	6
Amaranthus blitoides S. Watson	D	-	-	-	0	I	1	1	1
Amaranthus chlorostachys Willd.	Kn	-	-	-	0	II	5	6	6
Amaranthus lividus L.	Kn	-	-	-	0	II	3	3	3
Amaranthus retroflexus L.	Kn	-	-	-	0	VIII	288	405	408
Amorpha fruticosa L.	D	-	-	-	0	I	1	1	1
Anagallis arvensis L.	Ar	-	-	-	0	VII	218	284	284
Anagallis foemina Mill.	Ar	CR	N	KW	0	I	1	1	1
Anchusa arvensis (L.) M. Bieb.	Ar	-	-	-	0	VII	233	307	308
Anchusa officinalis L.	Ap	-	-	-	1	IV	41	44	44
Anemone ranunculoides L.	Nn	NT	-	-	10	II	6	6	6
Angelica sylvestris L.	Nn	-	-	-	6	V	90	111	111
Anthemis arvensis L.	Ar	-	-	-	0	V	79	141	143
Anthericum ramosum L.	Nn	VU	-	-	10	I	2	2	2
Anthoxanthum odoratum L. s. str.	Ap	-	-	-	3	V	57	64	64
Anthriscus cerefolium (L.) Hoffm.	Kn	-	-	-	0	I	1	1	1
Anthriscus sylvestris (L.) Hoffm.	Ap	-	-	-	1	VIII	296	432	434
Apera spica-venti (L.) B. Beauv.	Ar	-	-	-	0	VIII	420	633	637
Aphanes arvensis L.	Ar	-	-	-	0	II	5	5	5
Arabidopsis thaliana (L.) Heynch.	Ap	-	-	-	1	VI	147	238	239
Arabis glabra (L.) Bernh.	Ns	NT	-	-	5	II	9	10	10
Arabis hirsute (L.) Scop.	Nn	VU	-	-	8	IV	29	32	32
Arabis planisiliqua (Pers.) Rchb.	Ns	VU	SE	-	5	II	3	3	3
Arctium lappa L.	Ap	-	-	-	1	IV	41	50	50
Arctium minus (Hill.) Bernh.	Ap	-	-	-	1	IV	54	55	55
Arctium tomentosum Mill.	Ap	-	-	-	1	VII	271	395	397
Arenaria serpyllifolia L.	Ap	-	-	-	1	VII	209	300	301
Armeria maritima (Mill.) Willd. subsp. *elongata* (Hoffm.) Bonnier	Ap	-	-	-	4	IV	35	45	45
Armoracia rusticana P. Gaertn., B. Mey. &Scherb.	Ar	-	-	-	0	V	84	93	94
Arnoseris minima (L.) Schweigg. & Körte.	Ap	-	-	-	3	II	7	9	9
Arrhenatherum elatius (L.) P. Beauv ex J. Presl. & C. Presl	Ap	-	-	-	2	VII	237	321	323

Table A1. *Cont.*

Name of Species	**Species Information**								
1	2	3	4	5	6	7	8	9	10
Artemisia absinthium L.	Ar	-	-	-	0	VI	145	193	194
Artemisia campestris L. subsp. *campestris*	Ap	-	-	-	1	VI	147	207	208
Artemisia vulgaris L.	Ap	-	-	-	1	VIII	423	711	714
Asparagus officinalis L.	Kn	-	-	-	0	IV	38	42	42
Asperugo procumbens L.	Ar	-	-	W	0	IV	28	32	33
Aster lanceolatus Willd.	D	-	-	-	0	II	4	4	4
Astragalus arenarius L.	Ns	EN	-	-	4	II	3	3	3
Astragalus cicer L.	Ap	VU	-	-	3	III	16	19	19
Astragalus glycyphyllos L.	Ns	-	-	-	3	IV	43	51	51
Astrantia major L.	Nn	EN	N	K	10	I	1	1	1
Athyrium filix-femina (L.) Roth	Nn	-	-	-	10	III	12	12	12
Atriplex prostrate Boucher ex DC. subsp. *prostrata*	Ap	-	-	-	2	IV	41	47	47
Atriplex nitens Schkuhr	Ar	-	-	-	0	V	66	70	70
Atriplex patula L.	Ap	-	-	-	1	VI	146	181	181
Avena fatua L.	Ar	-	-	-	0	VII	208	278	278
Avena strigosa Schreb.	Ar	-	-	-	0	I	1	1	1
Avenaula pubescens (Huds.) Dumort.	Ns	-	-	-	5	IV	30	34	34
Ballota nigra L. subsp. *nigra*	Ar	-	-	-	0	VII	258	342	344
Batrachium circinatum (Sibth.) Fr.	Nn	LC	-	-	9	III	19	20	20
Batrachium trichophyllum (Chaix) Boss	Ns	-	-	-	5	III	19	19	19
Bellis perennis L.	Ap	-	-	-	2	V	86	104	104
Berberis vulgaris L.	Ns	VU	-	-	4	II	4	4	4
Berteroa incana (L.) DC.	Ap	-	-	-	1	V	83	105	107
Berula erecta (Huds.) Coville	Nn	-	-	-	7	II	10	12	12
Betula pendula Roth	Ap	-	-	-	3	VI	170	222	222
Betula pubescens Ehrh. subsp. *pubescens*	Nn	-	-	-	8	III	26	28	28
Bidens cernua L.	Ns	-	-	-	4	IV	44	49	49
Bidens frondosa L.	Kn	-	-	-	0	V	106	149	149
Bidens tripartita L.	Ns	-	-	-	4	VI	127	169	169
Blysmus compressus (L.) Panz. ex Link	Nn	VU	-	-	8	IV	44	54	54
Bolboschoenus maritimus (L.) Palla	Nn	-	-	KW	7	IV	54	64	64
Brachypodium pinnatum (L.) P. Beauv	Ns	LC	-	-	5	I	1	1	1
Brachypodium sylvaticum (Huds.) P. Beauv	Nn	-	-	-	6	V	81	101	101
Brassica nigra (L.) W. D. J. Koch	Kn	-	-	-	0	III	12	15	15
Briza media L.	Nn	-	-	-	7	IV	44	49	49
Bromus carinatus Hook. & Arn.	Kn	-	-	-	0	V	84	86	86
Bromus erectus Huds.	Ap	NT	-	W	4	II	4	5	5
Bromus inermis Leyss.	Ap	-	-	-	1	VI	171	213	213
Bromus hordeaceus L.	Ap	-	-	-	1	VII	265	371	372

Table A1. *Cont.*

Name of Species	**Species Information**								
1	2	3	4	5	6	7	8	9	10
Bromus secalinus L.	Ar	VU	-	-	0	I	1	1	1
Bromus sterilis L.	Ar	-	-	-	0	V	59	64	64
Bromus tectorum L.	Ar	-	-	-	0	V	65	75	75
Bryonia alba L.	Kn	-	-	-	0	III	17	18	19
Butomus umbellatus L.	Nn	-	-	-	7	V	81	101	101
Calamagrostis arundinacea (L.) Roth	Nn	-	-	-	9	II	4	4	4
Calamagrostis canescens (Weber) Roth	Nn	-	-	-	9	IV	33	36	36
Calamagrostis epigejos (L.) Roth	Ap	-	-	-	1	VI	184	242	243
Calamagrostis stricta (Timm) Koeler	Nn	NT	S	W	10	IV	52	61	61
Callitriche cophocarpa Sendt.	Ns	-	-	-	4	I	2	2	2
Calluna vulgaris (L.) Hull	Nn	-	-	-	7	I	2	2	2
Caltha palustris L. subsp. *palustris*	Nn	-	-	-	7	VI	146	204	204
Calystegia sepium (L.) R. Br.	Ns	-	-	-	4	VII	235	334	334
Camelina microcarpa Andrz.	Ar	-	-	-	0	VI	167	209	209
Campanula bononiensis L.	Nn	CR	N	K	8	I	1	1	1
Campanula glomerata L.	Ap	-	-	-	5	IV	32	37	37
Campanula patula L.	Ap	-	-	-	5	II	9	10	10
Campanula persicifolia L.	Nn	NT	-	-	8	II	4	6	6
Campanula rapunculoides L.	Ap	-	-	-	3	IV	30	34	35
Campanula rotundifolia L.	Ns	-	-	-	6	III	14	14	14
Campanula trachelium L.	Nn	NT	-	-	8	III	20	22	22
Cannabis ruderalis Janisch.	Kn	-	-	-	0	III	14	16	16
Capsella bursa-pastoris (L.) Medik.	Ar	-	-	-	0	VIII	409	764	770
Caragana arborescens Lam.	D	-	-	-	0	II	3	3	3
Cardamine amara L. subsp. *amara*	Nn	LC	-	-	9	I	1	1	1
Cardamine pratensis L. s. str.	Nn	-	-	-	7	V	59	63	63
Cardaminopsis arenosa (L.) Hayek subsp. *arenosa*	Ap	-	-	-	1	V	90	121	121
Cardaria draba (L.) Desv.	Kn	-	-	-	0	I	2	2	2
Carduus acanthoides L.	Ar	-	-	-	0	VII	193	256	259
Carduus crispus L.	Ap	-	-	-	4	IV	48	58	58
Carex acutiformis Ehrh.	Nn	-	-	-	5	VIII	279	422	424
Carex appropinquata Schumach.	Nn	VU	-	-	10	III	14	16	16
Carex caryophyllea Latourr.	Nn	VU	-	-	7	I	2	2	2
Carex cespitosa L.	Nn	EN	-	-	8	I	2	2	2
Carex diandra Schrank	Nn	EN	-	W	10	II	4	5	5
Carex digitata L.	Nn	LC	-	-	9	I	1	1	1
Carex dioica L.	Nn	CR	-	KW	10	I	1	1	1

Table A1. *Cont.*

Name of Species	**Species Information**								
1	2	3	4	5	6	7	8	9	10
Carex distans L.	Nn	NT	-	-	7	V	58	64	64
Carex disticha Huds.	Nn	LC	-	-	6	V	89	118	118
Carex elata All.	Nn	-	-	-	9	V	70	79	79
Carex elongata L.	Nn	VU	-	-	10	I	2	2	2
Carex ericetorum Pollich	Nn	-	-	-	6	I	2	2	2
Carex flacca Schreb.	Nn	NT	-	-	7	IV	48	58	58
Carex flava L.	Nn	VU	-	-	9	II	10	10	10
Carex gracilis Curtis	Nn	-	-	-	6	IV	40	46	46
Carex hirta L.	Ap	-	-	-	1	VIII	301	443	446
Carex lasiocarpa Ehrh.	Nn	EN	-	-	10	I	2	2	2
Carex lepidocarpa Tausch	Nn	VU	-	-	10	II	8	8	8
Carex nigra Reichard	Nn	-	-	-	6	IV	53	64	64
Carex ovalis Gooden.	Ap	-	-	-	4	II	8	8	8
Carex pairae F. W. Schultz	Ap	-	-	-	2	V	62	66	68
Carex panicea L.	Nn	-	-	-	8	V	73	94	94
Carex paniculata L.	Nn	-	-	-	7	IV	35	45	45
Carex pilulifera L.	Nn	-	-	-	6	I	2	2	2
Carex praecox Schreb.	Ap	-	-	-	3	III	26	29	29
Carex pseudocyperus L.	Nn	-	-	-	7	V	100	116	116
Carex remota L.	Nn	VU	-	-	10	II	6	7	7
Carex riparia Curtis	Nn	-	-	-	7	V	68	84	84
Carex rostrata Stokes	Nn	NT	-	-	8	III	19	23	23
Carex vesicaria L.	Nn	NT	-	-	9	I	2	2	2
Carex viridula Michx.	Nn	-	-	-	8	III	25	29	29
Carex vulpine L.	Ns	-	-	-	5	IV	49	53	53
Carlina vulgaris L.	Ap	-	-	-	4	I	2	2	2
Carpinus betulus L.	Nn	-	-	-	7	III	15	15	15
Carum carvi L.	Ap	-	-	-	3	V	80	99	100
Catabrosa aquatica (L.) P. Beauv.	Ns	VU	-	-	6	I	1	1	1
Centaurea cyanus L.	Ar	-	-	-	0	VIII	343	637	640
Centaurea jacea L.	Ns	-	-	-	4	VI	187	264	265
Centaurea scabiosa L.	Ap	-	-	-	2	VI	135	155	157
Centaurea stoebe L.	Ap	-	-	-	2	IV	47	54	54
Centaurium erythraea Rafn. subsp. *erythraea*	Ns	VU	-	-	6	II	7	7	7
Centaurium pulchellum (Sw.) Druce	Ap	VU	-	-	3	III	23	25	25
Cerastium arvense L. s. str.	Ap	-	-	-	3	VI	119	142	143
Cerastium holosteoides Fr. emend. Hyl.	Ap	-	-	-	3	VII	248	344	346

Table A1. *Cont.*

Name of Species	**Species Information**								
1	2	3	4	5	6	7	8	9	10
Cerastium semidecandrum L.	Ap	-	-	-	3	VI	141	185	185
Cerasus avium (L.) Moench.	Kn	-	-	-	0	III	19	19	19
Cerasus mahaleb (L.) Mill.	D	-	-	-	0	II	3	3	3
Cerasus vulgaris Mill. subsp. *vulgaris*	D	-	-	-	0	III	11	11	11
Ceratophyllum demersum L. s. str.	Nn	-	-	-	6	III	23	23	23
Chaenorhinum minus (L.) Lange.	Ap	-	-	-	1	V	79	92	92
Chaerophyllum bulbosum L.	Ap	-	-	-	3	III	24	25	26
Chaerophyllum temulum L.	Ns	-	-	-	4	VI	127	158	158
Chamaenerion angustifolium (L.) Scop.	Ap	-	-	-	3	IV	37	42	42
Chamomilla recutita (L.) Rauschert	Ar	-	-	-	0	IV	41	47	50
Chamomilla suaveolens (Pursh) Rydb.	Kn	-	-	-	0	VIII	297	406	409
Chelidonium majus L.	Ap	-	-	-	1	V	92	108	108
Chenopodium album L.	Ap	-	-	-	1	VIII	450	725	727
Chenopodium ficifolium Sm.	Ar	-	-	-	0	IV	47	47	47
Chenopodium glaucum L.	Ap	-	-	-	1	IV	37	39	40
Chenopodium hybridum L.	Ar	-	-	-	0	V	67	75	76
Chenopodium polyspermum L.	Ap	-	-	-	3	I	2	2	2
Chenopodium rubrum L.	Ap	-	-	-	2	V	70	75	75
Chenopodium strictum Roth	Kn	-	-	-	0	II	3	3	3
Chondrilla juncea L.	Ap	-	-	-	1	II	4	4	4
Chrysosplenium alternifolium L.	Nn	-	-	-	9	II	4	5	5
Cichorium intybus L. subsp. *intybus*	Ar	-	-	-	0	VI	154	191	193
Cicuta virosa L.	Nn	-	-	-	9	II	8	8	8
Circaea lutetiana L.	Nn	-	-	-	8	III	15	18	18
Cirsium acaule Scop.	Nn	EN	E	-	7	I	1	1	1
Cirsium arvense (L.) Scop.	Ap	-	-	-	1	VIII	467	1066	1074
Cirsium oleraceum (L.) Scop.	Ns	-	-	-	6	V	90	122	122
Cirsium palustre (L.) Scop.	Nn	-	-	-	7	V	88	125	125
Cirsium vulgare (Savi) Ten.	Ap	-	-	-	1	VI	157	192	192
Cladium mariscus (L.) Pohl	Nn	VU	SE	-	9	II	3	3	3
Clinopodium vulgare L.	Ns	-	-	-	5	II	5	7	7
Cnidium dubium (Sckuhr) Thell.	Nn	VU	-	KW	7	III	18	26	26
Comarum palustre L.	Nn	NT	-	-	10	III	25	36	36
Conium maculatum L.	Ar	-	-	-	0	III	19	29	29
Consolida regalis Gray	Ar	-	-	-	0	VI	190	221	221
Convallaria majalis L.	Nn	-	-	-	8	III	13	16	16
Convolvulus arvensis L.	Ap	-	-	-	1	VIII	390	654	658
Conyza canadensis (L.) Cronqust	Kn	-	-	-	0	VII	236	324	325
Coriandrum sativum L.	D	-	-	-	0	I	1	1	1

Table A1. *Cont.*

Name of Species	**Species Information**								
1	2	3	4	5	6	7	8	9	10
Cornus alba L.	D	-	-	-	0	II	7	8	8
Cornus sanguine L. subsp. *sanguinea*	Ns	-	-	-	4	V	71	87	87
Coronilla varia L.	Ap	-	-	-	2	V	56	63	64
Coronopus squamatus (Forssk.) Asch.	Ar	EN	-	KW	0	III	13	15	15
Corydalis intermedia (L.) Mérat	Nn	EN	E	-	10	I	2	2	2
Corylus avellana L.	Nn	-	-	-	6	IV	39	47	47
Corynephorus canescens (L.) P. Beauv.	Ap	-	-	-	4	IV	35	54	54
Cosmos bipinnatus Cav.	D	-	-	-	0	I	2	2	2
Cotoneaster divaricatus Rehder & E. H. Wilson	D	-	-	-	0	I	1	1	1
Crataegus laevigata (Poir.) DC.	Ns	-	-	-	7	I	1	1	1
Crataegus monogyna Jacq.	Ap	-	-	-	4	VII	231	315	315
Crepis biennis L.	Ap	VU	-	-	3	I	1	1	1
Crepis paludosa (L.) Moench	Nn	NT	-	-	9	II	10	13	13
Crepis tectorum L.	Ap	-	-	-	1	VI	118	186	187
Cucubalus baccife L.	Nn	VU	-	-	6	II	6	6	6
Cuscuta epithymum (L.) L. s. str.	Ns	VU	-	-	8	II	4	4	4
Cuscuta europaea L. subsp. *europaea*	Ns	NT	-	-	5	III	12	12	12
Cuscuta lupuliformis Krock.	Nn	NT	-	-	7	I	1	1	1
Cynoglossum officinale L.	Ap	-	-	-	3	V	81	93	93
Cynosurus cristatus L.	Ap	VU	-	-	6	II	3	3	3
Cyperus fuscus L.	Ns	-	-	-	6	IV	37	39	39
Dactylis glomerata L. subsp. *glomerata*	Ap	-	-	-	1	VIII	443	756	760
Dactylis polygama Horv.	Nn	-	-	-	9	II	4	4	4
Dactylorhiza incarnata (L.) Soó subps. *incarnata*	Nn	VU	-	W	9	IV	30	35	35
Dactylorhiza majalis (Rchb.) P. F. Hunt & Summerh.	Nn	VU	-	-	9	III	16	17	17
Danthonia decumbens DC.	Ns	-	-	-	7	II	9	11	11
Datura stramonium L.	Kn	-	-	-	0	IV	37	41	42
Daucus carota L.	Ap	-	-	-	1	V	68	84	85
Deschampsia caespitosa (L.) P. B. Beauv.	Ns	-	-	-	5	VII	263	380	381
Descurainia sophia (L.) Webb ex Prantl	Ar	-	-	-	0	VIII	364	612	617
Dianthus arenarius L.	Nn	CR	S	-	9	I	1	2	2
Dianthus barbatus L. s. str.	D	-	-	-	0	I	1	1	1
Dianthus carthusianorum L.	Ns	LC	-	-	7	II	7	7	7
Dianthus deltoids L.	Ap	-	-	-	5	II	4	4	4
Dianthus superbus L. s. str.	Nn	EN	-	-	7	II	7	7	7
Digitaria ischaemum (Schreb.) H. L. Mühl.	Ar	-	-	-	0	V	83	112	113
Digitaria sanguinalis (L.) Scop.	Ar	-	-	-	0	II	5	5	5

Table A1. *Cont.*

Name of Species	**Species Information**								
1	2	3	4	5	6	7	8	9	10
Draba nemorosa L.	Ns	EN	NW	KW	7	IV	34	35	35
Dryopteris carthusiana (Vill.) H. P Fuchs	Ns	-	-	-	5	IV	42	46	46
Dryopteris dilatata (Hofmm.) A. Gray	Nn	-	-	-	9	II	5	5	5
Dryopteris filix-mas (L.) Schott	Ns	-	-	-	5	IV	46	51	51
Echinochloa crus-galli (L.) P. Beauv.	Ar	-	-	-	0	VIII	298	391	393
Echinocystis lobata (F. Michx.) Torr. & A. Gray	Kn	-	-	-	0	II	8	8	8
Echinops sphaerocephalus L.	D	-	-	-	0	II	5	5	5
Echium vulgare L.	Ap	-	-	-	1	IV	49	59	59
Eleocharis acicularis (L.) Roem. &Schult.	Nn	VU	-	-	7	II	10	10	10
Eleocharis palustris (L.) Roem. &Schult. subsp. *palustris*	Nn	-	-	-	6	VI	146	188	188
Eleocharis quinqueflora (Hartmann) O. Schwarz	Nn	EN	-	KW	10	III	14	14	14
Eleocharis uniglumis (Link.) Schult.	Nn	VU	-	-	7	III	24	24	24
Elodea canadensis Michx.	Kn	-	-	-	0	II	7	7	7
Elsholtzia ciliata (Thunb.) Hyl.	Kn	-	-	-	0	I	1	1	1
Elymus caninus (L.) L.	Nn	NT	-	-	8	II	5	5	5
Elymus repens (L.) Gould.	Ap	-	-	-	1	VIII	483	1197	1204
Epilobium adnatum Griseb.	Ap	-	-	-	1	II	9	9	9
Epilobium ciliatum Raf.	Kn	-	-	-	0	III	14	15	15
Epilobium hirsutum L.	Ap	-	-	-	3	VII	249	309	312
Epilobium lamyi F. W. Schultz	Ns	-	-	-	6	I	1	1	1
Epilobium obscurum Schreb.	Nn	NT	-	-	6	II	5	5	5
Epilobium palustre L.	Nn	-	-	-	8	IV	28	34	34
Epilobium parviflorum Schreb.	Nn	-	-	-	8	V	67	76	76
Epilobium roseum Schreb.	Nn	VU	-	-	9	II	8	8	8
Epipactis helleborine (L.) Crantz s. str.	Ns	LC	-	-	6	III	12	12	12
Epipactis palustris (L.) Crantz	Nn	VU	-	K	9	II	6	7	7
Equisetum arvense L.	Ap	-	-	-	1	VIII	307	544	546
Equisetum fluviatile L.	Nn	LC	-	-	9	V	58	67	67
Equisetum hyemale L.	Ap	-	-	-	2	I	1	1	1
Equisetum palustre L.	Nn	-	-	-	6	VI	134	188	189
Eragrostis minor Host	Kn	-	-	-	0	I	1	1	1
Erigeron acris L.	Ap	-	-	-	2	III	21	22	22
Erigeron annuus (L.) Pers.	Kn	-	-	-	0	I	1	1	1
Eriophorum angustifolium Honck.	Nn	VU	-	-	10	II	9	10	10
Eriophorum latifolium Hoppe	Nn	CR	-	-	10	I	1	1	1
Erodium cicutarium (L.) L'Hér.	Ap	-	-	-	1	VI	189	271	274

Table A1. *Cont.*

Name of Species	**Species Information**								
1	2	3	4	5	6	7	8	9	10
Erophila verna (L.) Chevall.	Ap	-	-	-	1	VI	177	292	292
Eryngium planum L.	Ap	-	NW	W	2	VI	117	137	137
Erysimum cheiranthoides L.	Ap	-	-	-	2	IV	52	62	62
Euonymus europaea L.	Ns	-	-	-	6	V	86	101	101
Eupatorium cannabinum L.	Nn	-	-	-	5	VII	212	324	324
Euphorbia cyparissias L.	Ap	-	-	-	3	VI	136	168	169
Euphorbia esula L.	Ap	-	-	-	1	III	23	23	23
Euphorbia exigua L.	Ar	EN	-	KW	0	III	14	15	15
Euphorbia helioscopia L.	Ar	-	-	-	0	VII	209	321	322
Euphorbia lucida Waldst. & Kit.	Nn	CR	-	-	7	II	7	10	10
Euphorbia peplus L.	Ar	-	-	-	0	III	21	21	21
Euphrasia rostkoviana Hayne	Nn	EN	-	KW	8	II	5	5	5
Euphrasia stricta D. Wolf ex J. F. Lehm.	Nn	VU	-	-	8	III	16	18	18
Fagus sylvatica L. subsp. *sylvatica*	Ns	-	E	-	7	II	9	10	10
Falcaria vulgaris Bernh.	Ap	-	NE	W	2	VI	187	223	226
Fallopia convolvulus (L.) Á. Löve	Ar	-	-	-	0	VIII	388	581	583
Fallopia dumetorum (L.) Holub	Ns	-	-	-	4	V	99	121	121
Festuca arundinacea Schreb.	Ap	-	-	-	2	VII	202	256	258
Festuca trachyphylla (Hack.) Krajina	Ap	-	-	-	2	V	67	87	87
Festuca gigantea (L.) Vill.	Ns	-	-	-	6	V	87	102	102
Festuca heterophylla Lam.	Nn	NT	E	-	9	I	2	2	2
Festuca ovina L. s. str.	Ns	-	-	-	6	II	9	9	9
Festuca pratensis Huds.	Ap	-	-	-	2	VI	185	239	240
Festuca rubra L. s. str.	Ap	-	-	-	1	VIII	301	416	419
Ficaria verna Huds.	Ns	-	-	-	5	IV	29	31	31
Filago arvensis L.	Ap	LC	-	-	2	II	3	3	3
Filago minima (Sm.) Pers.	Ap	NT	-	-	2	III	14	16	16
Filipendula ulmaria (L.) Maxim.	Nn	-	-	-	5	IV	49	63	63
Filipendula vulgaris Moench	Ns	NT	-	-	7	II	5	5	5
Fragaria moschata Duchesne	Nn	CR	-	-	8	I	1	1	1
Fragaria vesca L.	Ns	-	-	-	7	III	25	30	30
Fragaria viridis Duchesne	Ns	-	SE	-	4	III	11	11	12
Fragaria x ananassa Duchesne	D	-	-	-	0	I	2	2	2
Frangula alnus Mill.	Nn	-	-	-	7	VI	118	152	152
Fraxinus excelsior L.	Ap	-	-	-	2	VII	225	292	293
Fraxinus pennsylvanica Marshall.	Kn	-	-	-	0	III	17	17	17
Fumaria officinalis L. subsp. *officinalis*	Ar	-	-	-	0	V	57	67	68

Table A1. *Cont.*

Name of Species	**Species Information**								
1	2	3	4	5	6	7	8	9	10
Gagea lutea (L.) Ker Gawl.	Nn	-	-	-	7	II	9	9	9
Gagea minima (L.) Ker Gawl.	Ap	EN	-	-	4	II	4	4	4
Gagea pratensis (Pers.) Dumort.	Ap	-	-	-	4	VI	179	209	209
Gaillardia aristata Pursh	D	-	-	-	0	I	1	1	1
Galeopsis bifida Boenn.	Ap	-	-	-	2	IV	38	45	45
Galeopsis ladanum L.	Ar	LC	-	-	0	III	16	20	20
Galeopsis pubescens Besser.	Ns	-	-	-	5	V	95	120	120
Galeopsis tetrahit L.	Ap	-	-	-	2	III	27	29	29
Galinsoga ciliata (Raf.) S. F. Blake	Kn	-	-	-	0	II	10	10	10
Galinsoga parviflora Cav.	Kn	-	-	-	0	VIII	338	502	504
Galium aparine L.	Ap	-	-	-	1	VIII	355	603	606
Galium boreale L.	Ns	-	-	-	7	II	9	11	11
Galium mollugo L. s. str.	Ap	-	-	-	2	VII	261	359	361
Galium odoratum (L.) Scop.	Nn	NT	-	-	9	I	1	1	1
Galium palustre L.	Ns	-	-	-	7	VI	190	244	245
Galium spurium L. subsp. *spurium*	Ar	-	-	-	0	VI	170	210	210
Galium uliginosum L.	Nn	-	-	-	8	VI	166	225	227
Galium verum L. s. str.	Ap	-	-	-	4	VII	214	269	271
Genista tinctoria L.	Ap	NT	-	-	5	I	1	1	1
Gentiana pneumonanthe L.	Nn	CR	-	-	9	I	1	1	1
Gentianella uliginosa (Willd.) Börner	Nn	CR	SE	KW	9	II	8	9	9
Geranium molle L.	Ar	-	-	-	0	IV	31	35	35
Geranium palustre L.	Nn	LC	-	-	9	III	15	17	17
Geranium pratense L.	Ap	-	-	-	4	VI	110	149	150
Geranium pusillum Burm. F. ex L.	Ar	-	-	-	0	VII	254	362	364
Geranium pyrenaicum Burm. F.	Kn	-	-	-	0	II	10	10	10
Geranium robertianum L.	Ap	-	-	-	2	VI	166	209	209
Geranium sanguineum L.	Nn	NT	-	-	8	I	1	2	2
Geum rivale L.	Nn	-	-	-	8	III	12	13	13
Geum urbanum L.	Ap	-	-	-	3	VII	195	255	256
Glaux maritima L.	Ns	CR	S	KW	6	I	2	2	2
Glechoma hederacea L.	Ap	-	-	-	2	VII	266	385	387
Gleditschia triacanthos L.	D	-	-	-	0	I	2	2	2
Glyceria fluitans (L.) R. Br.	Ns	-	-	-	6	IV	35	36	36
Glyceria maxima (Hartm.) Holmb.	Nn	-	-	-	6	V	99	119	119
Glyceria notata Chevall.	Ns	-	-	-	6	IV	37	39	40
Gnaphalium sylvaticum L.	Ap	-	-	-	4	I	2	2	2
Gnaphalium uliginosum L.	Ap	-	-	-	4	III	19	26	26
Gypsophila fastigiata L.	Nn	-	-	-	8	I	1	1	1
Gypsophila muralis L.	Ap	-	-	-	2	II	6	7	7

Table A1. *Cont.*

Name of Species	**Species Information**								
1	2	3	4	5	6	7	8	9	10
Gypsophila paniculata L.	D	-	-	-	0	II	3	6	6
Hedera helix L.	D	-	-	-	0	I	2	2	2
Helianthus tuberosus L.	Kn	-	-	-	0	II	7	7	7
Helichrysum arenarium (L.) Moench	Ap	-	-	-	2	V	66	84	85
Hemerocallis fulva L.	D	-	-	-	0	II	3	3	3
Heracleum sibiricum L.	Ap	-	-	-	1	VII	255	368	369
Herniaria glabra L.	Ap	-	-	-	1	II	4	6	6
Hesperis matronalis L. subsp. *matronalis*	D	-	-	-	0	II	6	6	6
Hieracium lachenalii C. C. Gmel.	Nn	-	-	-	7	II	9	10	10
Hieracium laevigatum Willd.	Nn	NT	-	-	7	I	1	1	1
Hieracium murorum L.	Nn	-	-	-	7	III	11	13	14
Hieracium pilosella L.	Ap	-	-	-	1	V	68	90	91
Hieracium piloselloides Vill.	Ap	NT	W	-	2	I	2	2	2
Hieracium sabaudum L.	Nn	LC	-	-	7	II	5	5	5
Hieracium umbellatum L.	Ap	NT	-	-	6	II	5	6	6
Hippuris vulgaris L.	Nn	VU	-	-	8	II	6	7	7
Holcus lanatus L.	Ap	-	-	-	4	V	92	123	123
Holcus mollis L.	Ap	-	-	-	4	I	2	2	2
Holosteum umbellatum L.	Ap	-	-	-	1	V	86	124	124
Hordeum murinum L.	Ar	-	-	-	0	III	11	13	13
Hottonia palustris L.	Nn	-	-	-	7	II	3	3	3
Humulus lupulus L.	Ns	-	-	-	5	V	86	101	101
Hydrocharis morsus-ranae L.	Nn	LC	-	-	9	IV	42	48	48
Hydrocotyle vulgaris L.	Nn	VU	-	K	9	III	16	18	18
Hyoscyamus niger L.	Ar	-	-	-	0	III	18	19	19
Hypericum maculatum Crantz	Ns	LC	-	-	6	I	1	1	1
Hypericum montanum L.	Nn	VU	-	-	9	II	3	3	3
Hypericum perforatum L.	Ap	-	-	-	1	VI	181	227	227
Hypericum tetrapterum Fr.	Nn	-	-	-	9	V	58	62	62
Hypochoeris glabra L.	Ap	VU	-	-	1	II	3	3	3
Hypochoeris maculate L.	Nn	CR	-	-	8	I	1	1	1
Hypochoeris radicata L.	Ap	-	-	-	2	IV	46	55	55
Impatiens glandulifera Royle	Kn	-	-	-	0	I	2	2	2
Impatiens noli-tangere L.	Nn	LC	-	-	8	II	6	6	6
Impatiens parviflora DC.	Kn	-	-	-	0	III	12	15	15
Inula britannica L.	Ns	-	-	-	4	V	108	155	156
Inula salicina L.	Nn	EN	-	K	7	I	2	2	2
Iris pseudacorus L.	Nn	-	-	-	6	VII	241	363	363

Table A1. *Cont.*

Name of Species	**Species Information**								
1	2	3	4	5	6	7	8	9	10
Iva xanthiifolia Nutt.	Kn	-	-	-	0	I	1	1	1
Jasione montana L.	Ap	-	-	-	3	II	9	9	9
Juglans regia L.	Kn	-	-	-	0	II	4	5	5
Juncus alpino-articulatus Chaix	Nn	EN	-	KW	8	II	7	7	7
Juncus articulates L. emend. K. Richt.	Ns	-	-	-	6	VI	170	235	236
Juncus bufonius L.	Ap	-	-	-	3	VI	119	155	155
Juncus compressus Jacq.	Ap	-	-	-	1	VI	115	142	142
Juncus effusus L.	Ap	-	-	-	4	IV	43	45	45
Juncus inflexus L.	Ns	-	-	-	5	V	91	112	112
Juncus ranarius J. O. E. Perrier & Songeon	Ap	-	-	-	3	III	13	13	13
Knautia arvensis (L.) J. M. Coult.	Ap	-	-	-	3	V	58	67	67
Kochia scoparia (L.) Schrad.	D	-	-	-	0	II	3	3	3
Lactuca serriola L.	Ar	-	-	-	0	VI	147	181	183
Lamium album L.	Ar	-	-	-	0	II	9	10	10
Lamium amplexicaule L.	Ar	-	-	-	0	VII	223	312	314
Lamium purpureum L.	Ar	-	-	-	0	VI	127	189	189
Lapsana communis L. s. str.	Ns	-	-	-	4	V	88	106	106
Lathyrus niger (L.) Bernh.	Nn	VU	-	-	9	II	4	4	4
Lathyrus palustris L.	Nn	NT	-	KW	8	IV	42	49	49
Lathyrus pratensis L.	Ap	-	-	-	3	V	96	118	118
Lathyrus sylvestris L.	Ap	-	-	-	3	I	2	2	2
Lathyrus tuberosus L.	Ar	-	-	-	0	II	6	7	7
Lathyrus vernus (L.) Bernh.	Nn	VU	-	-	10	II	4	4	4
Lavatera thuringiaca L.	Ap	VU	NW	KW	3	III	11	12	12
Lemna gibba L.	Ns	NT	-	-	5	I	2	2	2
Lemna minor L.	Ns	-	-	-	5	VI	174	203	203
Lemna trisulca L.	Nn	-	-	-	8	V	65	69	69
Leontodon autumnalis L. subsp. *autumnalis*	Ap	-	-	-	2	VI	191	247	249
Leontodon hispidus L. subsp. *hispidus*	Ns	-	-	-	6	IV	53	60	61
Leonurus cardiac L.	Ar	-	-	-	0	IV	32	34	35
Lepidium ruderale L.	Ar	-	-	-	0	V	83	88	90
Leucanthemum vulgare Lam. s. str.	Ns	-	-	-	6	III	15	16	16
Levisticum officinale W. D. J. Koch	D	-	-	-	0	II	3	3	3
Libanotis pyrenaica (L.) Bourg.	Ap	VU	-	-	6	II	7	7	7
Ligustrum vulgare L.	Kn	-	-	-	0	III	13	13	13
Lilium martagon L.	Nn	VU	-	-	10	II	3	3	3
Linaria vulgaris Mill.	Ap	-	-	-	2	VI	184	225	227
Linum catharticum L.	Nn	NT	-	-	8	IV	43	58	58
Liparis loeselii (L.) Rich.	Nn	CR	-	-	10	I	1	1	1

Table A1. *Cont.*

Name of Species	**Species Information**								
1	2	3	4	5	6	7	8	9	10
Listera ovata (L.) R. Br.	Nn	EN	-	-	9	II	5	5	5
Lithospermum arvense L.	Ar	-	-	-	0	VII	243	341	344
Lithospermum officinale L.	Nn	VU	-	K	9	IV	40	53	53
Lolium multiflorum Lam.	Kn	-	-	-	0	III	23	24	24
Lolium perenne L.	Ap	-	-	-	1	VIII	445	769	772
Lonicera tatarica L.	D	-	-	-	0	I	2	2	2
Lotus corniculatus L.	Ap	-	-	-	1	VI	136	160	161
Lotus tenuis Waldst. & Kit. ex Willd.	Ns	EN	-	KW	8	III	20	28	28
Lotus uliginosus Schkuhr	Nn	-	-	-	8	III	11	13	13
Lunaria annua L.	D	-	-	-	0	I	1	1	1
Lupinus polyphyllus Lindl.	Kn	-	-	-	0	I	2	2	2
Luzula campestris (L.) DC.	Ns	-	-	-	6	IV	41	44	44
Luzula multiflora (Retz.) Lej.	Nn	-	-	-	7	II	3	3	3
Luzula pilosa (L.) Willd.	Nn	-	-	-	8	III	11	14	14
Lychnis flos-cuculi L.	Nn	-	-	-	7	V	64	75	76
Lycium barbarum L.	Kn	-	-	-	0	V	56	59	60
Lycopus europaeus L.	Ns	-	-	-	5	VII	246	378	379
Lysimachia nummularia L.	Ns	-	-	-	6	VI	133	168	168
Lysimachia thyrsiflora L.	Nn	LC	-	-	9	IV	47	51	51
Lysimachia vulgaris L.	Ns	-	-	-	6	VIII	281	452	453
Lythrum salicaria L.	Nn	-	-	-	6	VII	259	385	388
Mahonia aquifolium (Pursh) Nutt.	D	-	-	-	0	I	1	1	1
Maianthemum bifolium (L.) F. W. Schmidt	Nn	-	-	-	9	III	19	24	24
Malus domestica Borkh.	Kn	-	-	-	6	VI	125	137	138
Malva alcea L.	Ar	NT	-	-	0	II	8	8	8
Malva neglecta Wallr.	Ar	-	-	-	0	VI	162	192	195
Malva pusilla Sm.	Ar	-	W	-	0	VI	151	168	170
Malva sylvestris L.	Ar	-	-	-	0	III	27	29	29
Matricaria naritima L. subsp. *inodora* (L.) Dostál	Ar	-	-	-	0	VIII	368	651	653
Matteucia struthiopteris (L.) Tod.	D	-	-	-	0	I	1	1	1
Medicago falcata L.	Ap	-	-	-	4	VI	113	125	126
Medicago lupulina L.	Ap	-	-	-	1	VIII	274	443	446
Medicago sativa L. s. str.	Kn	-	-	-	0	VI	126	142	143
Medicago x varia Martyn	Kn	-	-	-	0	IV	42	44	44
Melampyrum pratense L.	Nn	-	-	-	8	II	7	9	9
Melandrium album (Mill.) Garcke	Ap	-	-	-	1	VIII	413	692	694
Melandrium noctiflorum (L.) Fr.	Ar	-	-	-	0	VI	153	197	197

Table A1. *Cont.*

Name of Species	**Species Information**								
1	2	3	4	5	6	7	8	9	10
Melica nutans L.	Nn	LC	-	-	10	I	2	2	2
Melilotus alba Medik.	Ap	-	-	-	1	V	64	75	75
Melilotus dentata (Waldst. & Kit.) Pers.	Nn	VU	-	KW	7	III	21	25	25
Melilotus officinalis (L.) Pall.	Ap	-	-	-	1	III	11	12	12
Mentha aquatica L.	Nn	-	-	-	6	VII	257	401	401
Mentha arvensis L.	Ap	-	-	-	2	V	66	82	82
Mentha spicata L. emend L.	D	-	-	-	0	I	2	2	2
Mentha x piperita Ehrh. subsp. *citrata*	D	-	-	-	0	I	1	1	1
Mentha x verticillata L.	Ap	-	-	-	2	IV	30	36	36
Menyanthes trifoliata L.	Nn	VU	-	-	10	III	15	18	18
Milium effusum L.	Nn	-	-	-	8	II	9	10	10
Moehringia trinervia (L.) Clairv.	Ns	-	-	-	6	V	76	88	89
Molinia caerulea (L.) Moench s. str.	Nn	-	-	-	7	V	55	81	81
Morus alba L.	D	-	-	-	0	II	3	3	3
Muscari botryoides (L.) Mill.	D	-	-	-	0	I	2	2	2
Mycelismuralis (L.) Dumort.	Ns	-	-	-	6	IV	35	40	40
Myosotis arvensis (L.) Hill.	Ar	-	-	-	0	VIII	341	564	569
Myosotis caespitosa Schultz	Ns	VU	-	-	4	I	1	1	1
Myosotis palustris (L.) L. emend. Rchb. subsp. *palustris*	Nn	-	-	-	7	VI	184	242	243
Myosotis ramosissima Rochel	Ns	LC	-	-	6	II	8	8	8
Myosotis sylvatica Ehrh. ex Hofmm.	D	-	-	-	0	I	1	1	1
Myosotis sparsiflora Pohl	Ap	VU	-	-	4	I	2	2	2
Myosotis stricta Link ex Roem. &Schult.	Ap	-	-	-	2	VI	134	196	196
Myosoton aquaticum (L.) Moench	Ap	-	-	-	4	VI	155	192	193
Myosurus minimus L.	Ap	-	-	-	3	III	27	31	31
Myriophyllum spicatum L.	Nn	-	-	-	8	III	12	12	12
Myriophyllum verticillatum L.	Nn	-	-	-	8	II	7	9	9
Najas marina L.	Nn	EN	-	-	10	I	1	1	1
Narcissus poëticus L.	D	-	-	-	0	II	8	8	8
Nasturtium officinale R. Br.	Nn	CR	NE	KW	9	II	3	3	3
Nepeta cataria L.	Ar	VU	-	-	0	II	5	6	6
Neslia paniculata (L.) Desv.	Ar	VU	-	-	0	III	17	18	18
Nigella damascene L.	D	-	-	-	0	I	1	1	1
Nuphar lutea (L.) Sibth. & Sm.	Nn	-	-	-	8	V	71	83	83
Nymphaea alba L.	Nn	NT	-	-	10	III	12	17	17
Odontites serotina (Lam.) Rchb. s. str.	Ns	-	-	-	6	V	94	121	121

Table A1. *Cont.*

Name of Species	**Species Information**								
1	2	3	4	5	6	7	8	9	10
Odontites verna (Bellardi) Dumort.	Ar	VU	-	-	0	II	10	10	10
Oenanthe aquatica L.	Ns	-	-	-	5	V	57	64	64
Oenothera biennis L. s. str.	Ap	-	-	-	1	IV	28	43	43
Ononis arvensis L.	Ns	-	W	KW	5	V	56	69	69
Onopordum acanthium L.	Ar	-	-	-	0	IV	38	38	40
Origanum vulgare L.	Ap	VU	-	-	5	III	12	13	13
Ornithogalum nutans L.	D	-	-	-	0	I	1	1	1
Ornithogalum umbellatum L.	Kn	-	-	-	0	II	9	9	9
Ostericum palustre Besser	Nn	EN	W	-	8	I	2	2	2
Oxalis acetosella L.	Nn	-	-	-	9	I	2	2	2
Oxalis fontana Bunge	Kn	-	-	-	0	II	7	9	9
Padus avium Mill.	Nn	-	-	-	6	V	107	129	129
Padus serotina (Ehrh.) Borkh.	Kn	-	-	-	0	II	5	5	5
Paeonia officinalis L.	D	-	-	-	0	I	1	1	1
Papaver argemone L.	Ar	-	-	-	0	VI	147	185	185
Papaver dubium L.	Ar	-	-	-	0	IV	49	62	62
Papaver rhoeas L.	Ar	-	-	-	0	VIII	378	600	604
Paris quadrifolia L.	Nn	VU	-	-	10	III	18	19	19
Parnassia palustris L.	Nn	EN	-	KW	10	IV	34	42	42
Parthenocissus quinquefolia (L.) Planch. in A & C. DC.	D	-	-	-	0	II	3	3	3
Pastinaca sativa L. s. str.	Ap	-	-	-	2	VI	172	236	236
Pedicularis palustris L.	Nn	CR	-	-	10	I	1	1	1
Petasites hybridus (L.) P. Gaertn., B. Mey. &Scherb.	Ap	-	-	-	5	I	2	3	3
Petrorhagia prolifera (L.) P. W. Ball. & Heywood	Ap	-	E	-	3	I	1	1	1
Peucedanum cervaria (L.) Lapeyr.	Nn	EN	-	-	9	II	3	3	3
Peucedanum oreoselinum (L.) Moench	Ns	-	-	-	7	III	21	24	24
Peucedanum palustre (L.) Moench	Nn	LC	-	-	9	IV	35	48	48
Phacelia tanacetifolia Benth.	D	-	-	-	0	II	3	3	3
Phalaris arundinacea L.	Ns	-	-	-	5	VII	233	326	328
Philadelphus coronarius L.	D	-	-	-	0	I	1	1	1
Phleum phleoides (L.) H. Karst.	Ns	VU	-	-	7	II	3	3	3
Phleum pratense L.	Ap	-	-	-	4	VI	178	223	223
Phragmites australis (Cav.) Trin. ex Steud.	Ns	-	-	-	4	VIII	331	495	495
Physalis alkekengi L.	D	-	-	-	0	I	2	2	2
Phyteuma spicatum L.	Nn	EN	-	-	10	I	1	1	1
Picea abies (L.) H. Karst.	Kn	-	-	-	0	II	6	7	7

Table A1. *Cont.*

Name of Species	**Species Information**								
1	2	3	4	5	6	7	8	9	10
Picris hieracioides L. subsp. *hieracioides*	Ap	-	-	-	1	II	6	6	6
Pimpinella major (L.) Huds.	Nn	NT	-	-	8	II	8	8	8
Pimpinella nigra Mill.	Ap	-	-	-	3	VII	223	278	280
Pinus banksiana Lamb.	D	-	-	-	0	I	1	1	1
Pinus nigra J. F. Arnold	D	-	-	-	0	I	1	1	1
Pinus sylvestris L.	Ap	-	-	-	5	V	78	99	99
Plantago arenaria Waldst. & Kit.	Ap	NT	-	-	3	II	10	11	11
Plantago inermedia Gilib.	Ap	-	-	-	2	IV	34	37	37
Plantago lanceolata L.	Ap	-	-	-	1	VII	259	363	365
Plantago major L. s. str.	Ap	-	-	-	1	VIII	413	580	584
Plantago media L.	Ap	-	-	-	5	VI	124	151	153
Platanus x acerifolia (Aiton) Willd.	D	-	-	-	0	I	1	1	1
Poa annua L.	Ap	-	-	-	1	VIII	352	475	477
Poa compressa L. subsp. *compressa*	Ap	-	-	-	1	V	63	70	70
Poa nemoralis L. subsp. *nemoralis*	Ns	-	-	-	6	IV	41	47	47
Poa palustris L.	Nn	-	-	-	6	V	84	94	94
Poa pratensis L. s. str.	Ap	-	-	-	1	VIII	471	882	885
Poa trivialis L.	Ns	-	-	-	6	VII	249	345	346
Polygala amarelle Crantz	Nn	VU	-	-	8	II	4	5	5
Polygala comosa Schkuhr	Nn	NT	-	-	7	III	15	16	16
Polygala vulgaris L. s. str.	Nn	VU	-	-	8	II	4	7	7
Polygonatum multiflorum (L.) All.	Nn	NT	-	-	9	I	2	2	2
Polygonatum odoratum (Mill.) Druce	Nn	NT	-	-	9	III	15	18	18
Polygonum amphibium L.	Ap	-	-	-	4	VIII	348	588	590
Polygonum aviculare L.	Ap	-	-	-	1	VIII	445	874	878
Polygonum bistorta L.	Nn	NT	-	-	8	III	13	13	13
Polygonum hydropiper L.	Ap	-	-	-	3	III	11	11	11
Polygonum lapathifolium L. subsp. *lapathifolium*	Ap	-	-	-	1	VII	192	236	236
Polygonum lapathifolium L. subsp. *pallidum* (With.) Fr.	Ap	-	-	-	1	VII	193	238	238
Polygonum minus Huds.	Ap	-	-	-	3	II	7	8	8
Polygonum mite Schrank	Ap	-	-	-	3	II	6	6	6
Polygonum persicaria L.	Ap	-	-	-	1	VI	191	242	243
Polypodium vulgare L.	Nn	VU	-	-	9	II	5	5	5
Populus alba L.	Ap	-	-	-	3	V	82	97	98
Populus candicans Aiton	D	-	-	-	0	II	10	10	10
Populus 'Hybrida' 275	D	-	-	-	0	II	10	11	11
Populus nigra L.	Ns	VU	-	-	7	III	21	24	24
Populus nigra L. 'Italica'	D	-	-	-	0	I	2	2	2

Table A1. *Cont.*

Name of Species	**Species Information**								
1	2	3	4	5	6	7	8	9	10
Populus tremula L.	Ap	-	-	-	2	VI	110	132	132
Populus x canadensis Moench.	D	-	-	-	0	VI	122	143	143
Portulaca oleracea L. subsp. *oleracea*	Kn	-	-	-	0	I	1	1	1
Potamogeton compressus L.	Nn	VU	-	-	9	I	1	1	1
Potamogeton crispus L.	Nn	NT	-	-	7	II	7	7	7
Potamogeton gramineus L.	Nn	VU	-	-	9	I	1	1	1
Potamogeton lucens L.	Nn	VU	-	-	10	I	1	1	1
Potamogeton natans L.	Nn	NT	-	-	8	II	7	9	9
Potamogeton nodosus Poir.	Nn	LC	-	-	9	II	4	4	4
Potamogeton pectinatus L.	Nn	-	-	-	8	V	55	66	66
Potamogeton perfoliatus L.	Nn	NT	-	-	10	II	10	10	10
Potamogeton pusillus L.	Nn	EN	-	-	10	I	1	1	1
Potentilla anserina L.	Ap	-	-	-	3	VIII	295	489	492
Potentilla arenaria Borkh.	Ap	-	-	-	5	III	24	40	40
Potentilla argentea L. s. str.	Ap	-	-	-	1	V	98	118	118
Potentilla collina Wibel. s. str.	Ap	-	-	-	4	II	6	6	6
Potentilla erecta (L.) Raeusch.	Nn	NT	-	-	9	III	15	21	21
Potentilla heptaphylla L.	Ns	VU	-	-	7	II	3	3	3
Potentilla recta L.	Ap	NT	-	-	5	I	1	1	1
Potentilla reptans L.	Ap	-	-	-	1	VII	232	316	318
Potentilla supina L.	Ap	VU	-	-	3	I	2	2	2
Primula veris L.	Ns	-	-	-	7	III	18	23	23
Prunella vulgaris L.	Ap	-	-	-	3	VI	126	168	168
Prunus cerasifera Ehrh.	Kn	-	-	-	0	IV	53	57	57
Prunus domestica L. subsp. *domestica*	D	-	-	-	0	III	23	23	23
Prunus spinosa L.	Ap	-	-	-	4	V	101	129	129
Pteridium aquilinum (L.) Kuhn.	Nn	-	-	-	7	III	13	16	16
Puccinellia distans (Jacq.) Parl.	Ap	-	-	-	1	IV	35	40	40
Pulmonaria obscura Dumort.	Nn	VU	-	-	10	II	3	3	3
Pulsatilla pratensis (L.) Mill.	Nn	CR	-	-	8	I	1	1	1
Pyrola rotundifolia L.	Nn	EN	-	-	10	I	1	1	1
Pyrus pyraster (L.) Burgsd.	Ns	-	-	-	5	VII	220	262	262
Quercus petraea (Matt.) Liebl.	Nn	-	-	-	9	IV	28	33	33
Quercus robur L.	Ns	-	-	-	7	VI	125	160	160
Quercus rubra L.	Kn	-	-	-	0	II	9	9	9
Ranunculus acris L. s. str.	Ns	-	-	-	5	VII	271	404	406
Ranunculus auricomus L. s. l.	Nn	NT	-	-	8	I	1	1	1
Ranunculus bulbosus L.	Ap	-	-	-	5	IV	39	51	51

Table A1. *Cont.*

Name of Species	**Species Information**								
1	2	3	4	5	6	7	8	9	10
Ranunculus flammula L.	Ns	-	-	-	7	I	2	2	2
Ranunculus lanuginosus L.	Nn	NT	-	-	9	I	1	1	1
Ranunculus lingua L.	Nn	NT	-	-	10	III	17	18	18
Ranunculus polyanthemos L.	Ns	EN	-	-	8	I	2	2	2
Ranunculus repens L.	Ap	-	-	-	3	VIII	299	451	453
Ranunculus sardous Crantz	Ap	VU	-	-	4	II	6	8	8
Ranunculus sceleratus L.	Ap	-	-	-	5	V	86	97	97
Raphanus raphanistrum L.	Ar	-	-	-	0	VI	160	223	224
Reseda lutea L.	Kn	-	-	-	0	I	2	2	2
Reynoutria japonica Houtt.	D	-	-	-	0	II	4	4	4
Rhamnus cathartica L.	Ns	-	-	-	4	VI	175	229	229
Rheum rhabarbarum L.	D	-	-	-	0	I	1	1	1
Rhinanthus serotinus (Schönh.) Oborný subsp. *serotinus*	Ns	-	-	-	5	V	85	129	129
Rhus typhina L.	D	-	-	-	0	I	1	1	1
Ribes aureum Pursh	D	-	-	-	0	II	7	7	7
Ribes nigrum L.	Nn	-	-	-	9	IV	44	49	49
Ribes spicatum E. Robson	Nn	-	-	-	7	V	66	73	73
Ribes uva-crispa L. subsp. *uva-crispa*	Kn	-	-	-	0	II	9	9	9
Robinia pseudacacia L.	Kn	-	-	-	0	VI	164	188	188
Rorippa amphibia (L.) Besser.	Nn	-	-	-	7	VI	148	179	179
Rorippa palustris (L.) Besser.	Ap	-	-	-	4	IV	43	46	46
Rorippa sylvestris (L.) Besser.	Ap	-	-	-	4	IV	43	44	44
Rosa canina L.	Ap	-	-	-	4	VI	154	182	183
Rosa dumalis Bechst. emend. Boulenger	Ap	-	-	-	4	III	24	25	25
Rosa inodora Fr.	Ap	-	N	-	4	I	2	2	2
Rosa rubiginosa L.	Ap	-	-	-	5	II	5	5	5
Rosa rugosa Thunb.	D	-	-	-	0	I	2	2	2
Rosa sherardii Davies	Ap	-	-	-	5	IV	30	30	30
Rosa villosa L.	Ap	NT	SE	-	5	I	2	2	2
Rubus armeniacus Focke.	Kn	-	-	-	0	I	1	1	1
Rubus caesius L.	Ns	-	-	-	3	VIII	333	485	486
Rubus corylifolius Sm. agg.	Ap	-	-	-	5	II	6	6	6
Rubus fabrimontanus (Sprib.) Sprib.	Ap	VU	N	-	5	II	3	3	3
Rubus grabowskii Weihe ex Güenther ex All.	Ap	-	NE	-	5	I	2	2	2
Rubus gracilis J. Presl. & C. Presl.	Ns	-	N	-	6	III	24	28	28
Rubus idaeus L.	Ns	-	-	-	5	V	63	71	71
Rubus nessensis Hall.	Nn	-	-	-	6	I	2	3	3
Rubus plicatus Weihe & Nees	Nn	-	-	-	5	I	2	2	2

Table A1. *Cont.*

Name of Species	**Species Information**								
1	2	3	4	5	6	7	8	9	10
Rubus posnaniensis Sprib.	Nn	VU	N	-	6	I	1	1	1
Rubus saxatilis L.	Nn	-	-	-	9	II	4	4	4
Rubus sprengelii Weihe	Nn	-	NE	-	6	I	2	2	2
Rudbeckia laciniata L.	D	-	-	-	0	I	1	1	1
Rumex acetosa L.	Ap	-	-	-	2	VIII	275	383	385
Rumex acetosella L.	Ap	-	-	-	2	VI	165	310	312
Rumex conglomerates Murray.	Ns	NT	-	-	7	I	1	1	1
Rumex crispus L.	Ap	-	-	-	1	VII	262	360	362
Rumex hydrolapathum Huds.	Nn	-	-	-	6	VI	183	229	230
Rumex maritimus L.	Ap	-	-	-	4	V	76	81	81
Rumex obtusifolius L.	Ap	-	-	-	1	VI	144	166	167
Rumex palustris Sm.	Ap	VU	-	-	4	III	16	16	16
Rumex thyrsiflorus Fingerh.	Ap	-	-	-	2	III	11	11	11
Sagina nodosa (L.) Fenzl.	Nn	NT	-	-	8	III	17	19	19
Sagina procumbens L.	Ap	-	-	-	1	II	3	3	3
Sagittaria sagittifolia L.	Nn	VU	-	-	9	II	6	6	6
Salix acutifolia Willd.	D	-	-	-	0	II	6	6	6
Salix alba L.	Ap	-	-	-	2	VI	191	233	233
Salix aurita L.	Nn	-	-	-	8	II	3	3	3
Salix caprea L.	Ap	-	-	-	3	IV	42	42	42
Salix cinerea L.	Nn	-	-	-	6	VIII	312	452	455
Salix cordata Michx.	D	-	-	-	0	I	1	2	2
Salix fragilis L.	Ap	-	-	-	5	VI	171	214	215
Salix pentandra L.	Nn	-	-	-	8	IV	39	44	44
Salix purpurea L.	Ns	-	-	-	4	VI	147	191	191
Salix repens L. subsp. *rosmarinifolia* (L.) Hartm.	Nn	VU	-	-	9	III	21	31	31
Salix triandra L.	Ns	-	-	-	6	III	14	14	14
Salix viminalis L.	Ap	-	-	-	5	V	66	70	70
Salix x dasyclados Wimm.	Nn	-	-	-	7	II	5	5	5
Salsola kali subsp. *ruthenica* (Iljin) Soó	Kn	-	-	-	0	I	1	1	1
Salvia nemorosa L.	D	-	-	-	0	I	1	1	1
Salvia pratensis L.	Ap	-	-	-	6	III	14	14	14
Sambucus nigra L.	Ap	-	-	-	1	VIII	365	547	549
Sambucus racemosa L.	Kn	-	-	-	0	III	11	13	13
Sanguisorba officinalis L.	Nn	NT	-	-	8	II	5	9	9
Sanicula europaea L.	Nn	NT	-	-	9	I	2	2	2
Saponaria officinalis L.	Ap	-	-	-	2	V	64	71	71
Sarothamnus scoparius (L.) W. D. J. Koch	Kn	-	-	-	0	II	7	9	9
Saxifraga granulata L.	Nn	NT	-	-	7	I	2	2	2
Saxifraga tridactylites L.	Ap	-	-	-	1	V	55	68	68

Table A1. *Cont.*

Name of Species	**Species Information**								
1	2	3	4	5	6	7	8	9	10
Scabiosa canescens Waldst. & Kit.	Nn	CR	E	-	8	I	1	1	1
Schoenoplectus lacustris (L.) Palla	Nn	-	-	-	8	IV	34	38	38
Schoenoplectus tabernaemontani (C. C. Gmel.) Palla	Nn	-	-	-	9	V	55	65	65
Scirpus sylvaticus L.	Nn	-	-	-	7	V	93	111	111
Scleranthus annuus L.	Ar	-	-	-	0	V	109	170	171
Scleranthus perennis L.	Ap	-	-	-	3	I	1	4	4
Scolochloa festucacea (Willd.) Link	Nn	VU	SW	KW	10	III	17	18	18
Scorzonera humilis L.	Nn	NT	-	-	9	II	3	3	3
Scrophularia nodosa L.	Ns	-	-	-	5	III	17	20	20
Scrophularia umbrosa Dumort.	Nn	-	-	-	9	V	59	67	67
Scutellaria galericulata L.	Nn	-	-	-	8	V	98	115	115
Sedum acre L.	Ap	-	-	-	1	IV	48	64	64
Sedum maximum (L.) Hoffm.	Ns	-	-	-	5	IV	41	48	49
Sedum reflexum L.	Nn	NT	E	-	7	I	1	1	1
Sedum spurium M. Bieb.	D	-	-	-	0	I	2	2	2
Selinum carvifolia (L.) L.	Nn	LC	-	-	7	III	19	26	26
Senecio congestus (R. Br.) DC.	Nn	NT	-	-	7	III	23	24	24
Senecio erucifolius L.	Nn	CR	-	-	7	I	1	1	1
Senecio jacobaea L.	Ap	-	-	-	1	V	60	72	72
Senecio sylvaticus L.	Ap	-	-	-	4	III	12	12	12
Senecio vernalis Waldst. & Kit.	Kn	-	-	-	0	V	83	112	112
Senecio vulgaris L.	Ar	-	-	-	0	III	22	23	23
Serratula tinctoria L.	Nn	VU	-	-	8	III	13	16	16
Setaria pumila (Poir.) Roem. &Schult.	Ar	-	-	-	0	III	26	29	29
Setaria viridis (L.) P. Beauv.	Ar	-	-	-	0	VII	203	271	273
Silene conica L.	Kn	-	-	-	0	II	3	4	4
Silene vulgaris (Moench) Garcke	Ap	-	-	-	1	V	78	102	103
Silene nutans L. subsp. *nutans*	Nn	-	-	-	8	II	6	6	6
Silene otites (L.) Wibel	Ns	EN	-	-	7	I	1	1	1
Sinapis arvensis L.	Ar	-	-	-	0	VII	270	363	364
Sisymbrium altissimum L.	Kn	-	-	-	0	III	12	14	14
Sisymbrium loeselii L.	Kn	-	-	-	0	IV	42	42	42
Sisymbrium officinale (L.) Scop.	Ar	-	-	-	0	VI	167	198	200
Sium latifolium L.	Nn	-	-	-	6	VI	185	248	248
Solanum dulcamara L.	Ns	-	-	-	6	VI	160	211	211
Solanum nigrum L. emend. Mill.	Ar	-	-	-	0	VI	140	173	174
Solidago canadensis L.	Kn	-	-	-	0	II	7	8	8

Table A1. *Cont.*

Name of Species	**Species Information**								
1	2	3	4	5	6	7	8	9	10
Solidago gigantea Aiton	Kn	-	-	-	0	I	1	1	1
Solidago virgaurea L. s. str.	Nn	-	-	-	6	III	16	22	22
Sonchus arvensis L. subsp. *arvensis*	Ap	-	-	-	3	VII	238	351	352
Sonchus asper (L.) Hill	Ar	-	-	-	0	V	95	117	117
Sonchus oleraceus L.	Ar	-	-	-	0	V	74	87	87
Sorbaria sorbifolia (L.) A. Braun	D	-	-	-	0	I	1	1	1
Sorbus aria (L.) Crantz	D	-	-	-	0	I	1	1	1
Sorbus aucuparia L. emed. Hendl. subsp. *aucuparia*	Ns	-	-	-	6	V	80	105	105
Sorbus intermedia (Ehrh.) Pers.	D	-	-	-	0	II	4	4	4
Sparganium emersum Rehmann	Ns	-	-	-	8	II	3	3	3
Sparganium minimum Wallr.	Nn	EN	-	-	9	I	2	2	2
Sparganium erectum L. emend. Rchb. s. str.	Nn	-	-	-	7	V	72	78	78
Spergula arvensis L. subsp. arvensis	Ar	-	-	-	0	VI	169	253	254
Spergula morisonii Boreau	Ap	-	-	-	2	III	21	24	24
Spergularia rubra (L) J. Presl & C. Presl	Ap	-	-	-	2	II	6	6	6
Spirodela polyrhiza (L.) Schleid.	Ns	-	-	-	7	IV	29	35	35
Stachys annua (L.) L.	Ar	VU	-	-	0	II	3	3	3
Stachys palustris L.	Ns	-	-	-	6	VI	173	252	252
Stachys recta L.	Nn	VU	-	-	8	II	3	3	3
Stachys sylvatica L.	Nn	-	-	-	7	III	17	20	20
Stellaria graminea L.	Ap	-	-	-	4	III	25	26	27
Stellaria media (L.) Vill.	Ap	-	-	-	1	VIII	432	848	852
Stellaria palustris Retz.	Nn	-	-	-	8	V	73	76	76
Stellaria uliginosa Murray	Ns	VU	-	-	6	I	1	1	1
Stratiotes aloides L.	Nn	-	-	-	9	III	11	12	12
Succisa pratensis Moench	Nn	VU	-	-	9	II	9	13	13
Symphoricarpos albus (L.) S. F. Blake	D	-	-	-	0	III	27	28	28
Symphytum officinale L.	Ns	-	-	-	5	V	88	118	118
Syringa vulgaris L.	D	-	-	-	0	IV	35	36	36
Tanacetum vulgare L.	Ap	-	-	-	2	III	24	26	27
Taraxacum officinale F. H. Wigg.	Ap	-	-	-	1	VIII	427	735	739
Taraxacum palustre (Lyons) Symons agg.	Nn	CR	-	KW	8	III	12	12	12
Tetragonolobus maritimus (L.) Roth.	Nn	EN	-	KW	8	III	14	16	16
Teucrium scordium L.	Nn	NT	-	KW	8	V	91	110	110
Thalictrum flavum L.	Nn	-	-	-	7	VI	138	197	197
Thalictrum lucidum L.	Ns	VU	-	-	8	I	2	2	2
Thalictrum minus L. subsp. *minus*	Ns	NT	-	-	7	II	7	7	7
Thelypteris palustris Schott	Nn	-	-	-	10	V	60	74	74
Thladiantha dubia Bunge	D	-	-	-	0	II	8	8	8

Table A1. *Cont.*

Name of Species	**Species Information**								
1	2	3	4	5	6	7	8	9	10
Thlaspi arvense L.	Ar	-	-	-	0	VII	232	353	356
Thymus pulegioides L.	Nn	VU	-	-	6	II	4	5	5
Thymus serpyllum L. emend. Fr.	Ap	NT	-	-	3	II	6	7	7
Tilia cordata Mill.	Ap	-	-	-	4	IV	43	48	48
Tilia platyphyllos Scop.	D	-	-	-	0	III	19	19	19
Torilis japonica (Hott.) DC.	Ap	-	-	-	3	VI	163	213	215
Tragopogon dubius Scop.	Ap	-	-	-	1	III	13	14	14
Tragopogon pratensis L. s. str.	Ap	-	-	-	2	V	98	107	109
Trifolium alpestre L.	Ns	-	-	-	7	II	6	6	6
Trifolium arvense L.	Ap	-	-	-	1	V	67	85	87
Trifolium aureum Pollich	Ap	-	-	-	4	I	1	1	1
Trifolium campestre Schreb.	Ap	-	-	-	3	III	20	26	26
Trifolium dubium Sibth.	Ap	-	-	-	3	IV	36	38	38
Trifolium fragiferum L. subsp. *fragiferum*	Ns	-	-	-	5	V	98	127	127
Trifolium hybridum L. subsp. *hybridum*	Ns	-	-	-	5	IV	31	33	33
Trifolium medium L.	Ap	-	-	-	4	III	22	22	22
Trifolium montanum L.	Nn	NT	-	-	6	I	2	2	2
Trifolium pratense L.	Ap	-	-	-	2	VII	223	316	317
Trifolium repens L. subsp. *repens*	Ap	-	-	-	1	VIII	325	491	493
Triglochin maritimum L.	Nn	VU	SE	KW	6	III	12	13	13
Triglochin palustre L.	Nn	NT	-	-	8	IV	33	42	42
Trisetum flavescens (L.) P. Beauv.	Ap	NT	-	-	5	I	1	1	1
Trollius europaeus L. s. str.	Nn	EN	-	-	8	II	4	5	5
Tussilago farfara L.	Ap	-	-	-	1	VI	162	203	204
Typha angustifolia L.	Nn	-	-	-	6	V	104	117	117
Typha latifolia L.	Ns	-	-	-	4	VI	161	198	200
Ulmus glabra Huds.	Ap	-	-	-	3	V	84	92	92
Ulmus laevis Pall.	Ns	-	-	-	4	VI	146	181	181
Ulmus minor Mill.	Ap	-	-	-	3	V	64	70	70
Urtica dioica L. subsp. *dioica*	Ap	-	-	-	2	VIII	439	784	787
Urtica urens L.	Ar	-	-	-	0	VI	119	131	133
Utricularia vulgaris L.	Nn	NT	-	-	8	III	23	24	24
Vaccinium myrtillus L.	Nn	-	-	-	8	II	9	10	10
Vaccinium vitis-idaea L.	Nn	-	-	-	8	II	4	4	4
Valeriana dioica L. s. str.	Nn	VU	-	-	9	III	23	27	27
Valeriana officinalis L.	Ns	-	-	-	4	VI	126	161	161
Valerianella dentata (L.) Pollich	Ar	NT	-	-	0	II	6	6	6
Verbascum nigrum L.	Ap	LC	-	-	3	III	14	15	15

Table A1. *Cont.*

Name of Species	**Species Information**								
1	2	3	4	5	6	7	8	9	10
Verbascum phlomoides L.	Ap	-	-	-	1	V	67	80	80
Verbascum phoeniceum L.	Nn	EN	W	-	7	I	1	1	1
Verbascum densiflorum Bertol.	Ap	-	-	-	1	II	4	4	4
Veronica agrestis L.	Ar	-	-	-	0	IV	32	36	36
Veronica anagallis-aquatica L.	Ns	-	-	-	6	IV	46	48	48
Veronica arvensis L.	Ar	-	-	-	0	VII	215	294	297
Veronica beccabunga L.	Nn	-	-	-	7	III	13	13	13
Veronica catenata Pennell	Ns	NT	-	-	7	III	22	26	26
Veronica chamaedrys L. s. str.	Ap	-	-	-	3	VI	180	250	251
Veronica dillenii Crantz	Ap	-	-	-	1	III	25	38	38
Veronica hederifolia L.	Ap	-	-	-	2	VIII	402	559	559
Veronica officinalis L.	Ns	-	-	-	7	III	19	24	24
Veronica opaca Fr.	Ar	VU	-	-	0	II	5	5	5
Veronica persica Poir.	Kn	-	-	-	0	VI	176	261	262
Veronica polita Fr.	Ar	-	-	-	0	VI	142	189	190
Veronica praecox All.	Ap	VU	-	KW	1	III	11	11	11
Veronica scutellata L.	Nn	NT	-	-	8	III	12	12	12
Veronica serpyllifolia L.	Ap	-	-	-	3	II	4	4	4
Veronica spicata L. subsp. *spicata*	Ns	NT	-	-	8	II	3	4	4
Veronica triphyllos L.	Ar	-	-	-	0	VII	273	343	343
Veronica verna L.	Ap	-	-	-	2	III	13	18	18
Viburnum opulus L.	Nn	-	-	-	8	V	65	72	72
Vicia angustifolia L.	Ar	-	-	-	0	VI	161	235	237
Vicia cassubica L.	Nn	-	-	-	7	III	15	18	18
Vicia cracca L.	Ap	-	-	-	3	VII	199	292	294
Vicia dumetorum L.	Ns	EN	-	-	8	I	1	1	1
Vicia grandiflora Scop.	Kn	-	-	-	0	III	24	41	41
Vicia hirsuta (L.) Gray	Ar	-	-	-	0	VI	131	199	201
Vicia lathyroides L.	Ns	NT	E	-	5	I	1	1	1
Vicia sativa L.	D	-	-	-	0	I	2	2	2
Vicia sepium L.	Ns	-	-	-	7	III	19	22	22
Vicia tenuifolia Roth	Nn	VU	-	-	7	II	4	4	4
Vicia tetrasperma (L.) Schreb.	Ar	-	-	-	0	V	61	77	78
Vicia villosa Roth	Ar	-	-	-	0	VI	121	179	182
Vinca minor L.	D	-	-	-	0	II	3	4	4
Viola arvensis Murray	Ar	-	-	-	0	VIII	414	745	751
Viola canina L. s. str.	Ns	-	-	-	7	III	20	22	22
Viola hirta L.	Nn	NT	-	-	8	III	13	17	17
Viola mirabilis L.	Nn	VU	-	-	10	I	1	1	1

Table A1. *Cont.*

Name of Species	Species Information								
1	2	3	4	5	6	7	8	9	10
Viola odorata L.	Ar	-	-	-	0	V	66	73	73
Viola reichenbachiana Jord. ex Boreau	Nn	NT	-	-	10	III	11	11	11
Viola riviniana Rchb.	Nn	-	-	-	8	III	19	24	24
Viola rupestris F. W. Schmidt	Nn	VU	-	-	8	II	8	8	8
Viola stagnina Kit.	Nn	EN	-	KW	9	II	8	8	8
Viscaria vulgaris Röhl	Nn	-	-	-	7	I	1	1	1
Viscum album L. subsp. *album*	Ap	-	-	-	3	II	9	9	9
Xanthium albinum (Widder) H. Scholz	Kn	-	-	-	0	II	4	4	4
Xanthium strumarium L.	Kn	-	-	-	0	II	5	5	5
Zannichellia palustris L. subsp. *palustris*	Nn	VU	-	-	8	I	1	1	1

Explanations: Column 1. Alphabetic list of species; Column 2. Floristic group based on origin status: non-synanthropic native species (Nn), semi-synanthropic native species (Ns), apophytes (Ap), archaeophytes (Ar), kenophytes (Kn), diaphytes (D); Column 3. Frequency class: very rare (I), rare (II), infrequent (III), widely distributed (IV), moderately frequent (V), frequent (VI), common (VII), very common (VIII); Column 4. Significance of local resources: significant on the scale of Kuyavia (K), significant on the scale of Wielkopolska (W), significant for both regions: Kujavia and Wielkopolska (KW); Column 5. Chorological aspect: N, NE, E, SE, S, SW, W, or NW limit of species distribution; Column 6. Threat status of local resources according to IUCN criteria: critically endangered (CR), endangered (EN), vulnerable (VU), near threatened (NT), least concern (LC); Column 7. Coefficient of conservatism (*c*); Column 8. Number of grid cells; Column 9. Number of floristic lists; Column 10. Number of floristic data.

References

1. Hooper, D.U.; Chapin, F.S.; Ewel, J.J.; Hector, A.; Inchausti, P.; Lavorel, S.; Lawton, J.H.; Lodge, D.M.; Loreau, M.; Naeem, S.; et al. Effects of biodiversity on ecosystem functioning: A consensus of current knowledge. *Ecol. Monogr.* **2005**, *75*, 3–35. [CrossRef]
2. Sala, O.E.; Stuart Chapin, F., III; Armesto, J.E.; Berlow, E.; Bloomfield, J.; Dirzo, R.; Huber-Sanwald, E.; Huenneke, L.F.; Jackson, R.B.; Kinzig, A.; et al. Global Biodiversity Scenarios for the Year 2100. *Science* **2000**, *287*, 1770–1774. [CrossRef] [PubMed]
3. Uuemaa, E.; Antrop, M.; Roosaare, J.; Marja, R.; Mander, Ü. Landscape Metrics and Indices: An Overview of Their Use in Landscape Research. *Living Rev. Landsc. Res.* **2009**, *3*, 1–28. [CrossRef]
4. Moser, D.; Zechmeister, H.G.; Plutzar, C.; Sauberer, N.; Wrbka, T.; Grabherr, G. Landscape patch shape complexity as an effective measure for plant species richness in rural landscapes. *Landsc. Ecol.* **2002**, *17*, 657–669. [CrossRef]
5. Waldhardt, R.; Simmering, D.; Albrecht, H. Floristic diversity at the habitat scale in agricultural landscapes of Central Europe—Summary, conclusions and perspectives. *Agric. Ecosyst. Environ.* **2003**, *98*, 79. [CrossRef]
6. Liira, J.; Schmidt, T.; Aavik, T.; Arens, P.; Augenstein, I.; Bailey, D.; Billeter, R.; Bukáček, R.; Burel, F.; De Blust, G.; et al. Plant functional group composition and large-scale species richness in European agricultural landscapes. *J. Veg. Sci.* **2008**, *19*, 3–14. [CrossRef]
7. Grashof-Bokdam, J. Forest plants in an agricultural landscape in the Netherlands: Effects of habitat fragmentation. *J. Veg. Sci.* **1997**, *8*, 21–28. [CrossRef]
8. Jaskulski, D.; Jaskulska, I. Plant diversity in agroecosystems and agricultural landscapes. In *Biodiversity Conservation and Utilization in a Diverse World*; Lameed, G.A., Ed.; InTech Open: London, UK, 2012; pp. 3–22. [CrossRef]
9. Zarzycki, J.; Korzeniak, J.; Perzanowska, J. Impact of Land Use Changes on the Diversity and Conservation Status of the Vegetation of Mountain Grasslands (Polish Carpathians). *Land* **2022**, *11*, 252. [CrossRef]
10. Szymura, T.H.; Szymura, M. Spatial structure of grassland patches in Poland: Implications for nature conservation. *Acta Soc. Bot. Pol.* **2018**, *88*, 1–13. [CrossRef]
11. Krauss, J.; Klein, A.-M.; Steffan-Dewenter, I.; Tscharntke, T. Effects of habitat area, isolation, and landscape diversity on plant species richness of calcareous grasslands. *Biodivers. Conserv.* **2004**, *13*, 1427–1439. [CrossRef]
12. Dauber, J.; Hirsch, M.; Simmering, D.; Waldhardt, R.; Otte, A.; Wolters, V. Landscape structure as an indicator of biodiversity: Matrix effects on species richness. *Agric. Ecosyst. Environ.* **2003**, *98*, 321–329. [CrossRef]
13. Wrzesień, M.; Denisow, B. The effect of agricultural landscape type on field margin flora in south eastern Poland. *Acta Bot. Croat.* **2016**, *75*, 217–225. [CrossRef]
14. Dániel-Ferreira, J.; Bommarco, R.; Wissman, J.; Öckinger, E. Linear infrastructure habitats increase landscape-scale diversity of plants but not of flower-visiting insects. *Sci. Rep.* **2020**, *10*, 21374. [CrossRef]

15. Cousins, S.A.O. Plant species richness in midfield islets and road verges—The effect of landscape fragmentation. *Biol. Conserv.* **2006**, *127*, 500–509. [CrossRef]
16. Vinter, T.; Dinnétz, P.; Danzer, U.; Lehtila, K. The relationship between landscape configuration and plant species richness in forests is dependent on habitat preferences of species. *Eur. J. For. Res.* **2016**, *135*, 1071–1082. [CrossRef]
17. Gołdyn, H. Changes in plant species diversity of aquatic ecosystems in the agricultural landscape in West Poland in the last 30 years. *Biodivers. Conserv.* **2010**, *19*, 61–80. [CrossRef]
18. Reidsma, P.; Tekelenburg, T.; van den Berg, M.; Alkemade, R. Impacts of land-use change on biodiversity: An assessment of agricultural biodiversity in the European Union. *Agric. Ecosyst. Environ.* **2006**, *114*, 86. [CrossRef]
19. Gamrat, R.; Gałczyńska, M. Flora diversity of field forest patches in landscapes with varied geomorphological units and land use in Poland. *Appl. Ecol. Environ. Res.* **2021**, *19*, 1473–1489. [CrossRef]
20. Barcikowski, A.; Cyzman, W.; Marchwiński, M.; Wojciechowska, A. Changes in floristic richness and diversity of phytocoenoses on riparian habitats affected by diverse land-use forms. *Ecol. Quest.* **2016**, *23*, 9–14. [CrossRef]
21. Kiedrzyński, M.; Kiedrzyńska, E.; Witosławski, P.; Urbaniak, M.; Kurowski, J.K. Historical Land Use, Actual Vegetation, and the Hemeroby Levels in Ecological Evaluation of an Urban River Valley in Perspective of Its Rehabilitation Plan. *Pol. J. Environ. Stud.* **2014**, *23*, 109–117. Available online: http://www.pjoes.com/pdf-89173-23032?filename=Historical%20Land%20Use_.pdf (accessed on 15 November 2022).
22. Deutschewitz, K.; Lausch, A.; Kühn, I.; Klotz, S. Native and alien plant species richness in relation to spatial heterogeneity on a regional scale in Germany. *Glob. Ecol. Biogeogr.* **2003**, *12*, 299–311. [CrossRef]
23. Kumar, S.; Stohlgren, T.J.; Chong, G.W. Spatial heterogeneity influences native and nonnative plant species richness. *Ecology* **2006**, *87*, 3186–3199. [CrossRef] [PubMed]
24. Collingham, Y.C.; Wadsworth, R.A.; Huntley, B.; Hulme, P.E. Predicting the spatial distribution of non-indigenous riparian weeds: Issues of spatial scale and extent. *J. Appl. Ecol.* **2000**, *37* (Suppl. 1), 13–27. [CrossRef]
25. Honnay, O.; Piessens, K.; Van Landuyt, W.; Hermy, M.; Gulinck, H. Satellite based land use and landscape complexity indices as predictors for regional plant species diversity. *Landsc. Urban Plan.* **2003**, *63*, 241–250. [CrossRef]
26. Balvanera, P.; Andrea, B.; Pfisterer, A.B.; Buchmann, N.; He, J.-S.; Nakashizuka, T.; Raffaelli, D.; Schmid, B. Quantifying the evidence for biodiversity effects on ecosystem functioning and services. *Ecol. Lett.* **2006**, *9*, 1146–1156. [CrossRef] [PubMed]
27. Loreau, M.; Naeem, S.; Inchausti, P.; Bengtsson, J.; Grime, J.P.; Hector, A.; Hooper, D.U.; Huston, M.A.; Raffaelli, D.; Schmid, B.; et al. Biodiversity and ecosystem functioning: Current knowledge and future challenges. *Science* **2001**, *294*, 804–808. [CrossRef]
28. Petchey, O.L.; Gaston, K.J. Functional diversity (FD), species richness and community composition. *Ecol. Lett.* **2002**, *5*, 402–411. [CrossRef]
29. Petchey, O.L.; Gaston, K.J. Functional diversity: Back to basics and looking forward. *Ecol. Lett.* **2006**, *9*, 741–758. [CrossRef]
30. Petchey, O.L.; Gaston, K.J. Effects on ecosystem resilience of biodiversity, extinctions, and the structure of regional species pools. *Theor. Ecol.* **2009**, *2*, 177–187. [CrossRef]
31. Roscher, C.; Schumacher, J.; Gubsch, M.; Lipowsky, A.; Weigelt, A.; Buchmann, N.; Schulze, E.-D. Using Plant Functional Traits to Explain Diversity–Productivity Relationships. *PLoS ONE* **2012**, *7*, e36760. [CrossRef]
32. Council of Europe Landscape Convention 1 as Amended by the 2016 Protocol. Available online: https://rm.coe.int/16807b6bc7 (accessed on 18 November 2022).
33. Europejska Konwencja Krajobrazowa (Dz. U., 2006, Nr 14, poz. 98). Available online: https://isap.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=wdu20060140098 (accessed on 18 January 2023).
34. Myga-Piątek, U.; Nita, J. Polityka krajobrazowa Polski—U progu wdrożeń [Landscape policy of Poland—The initial stage of implementation]. *Przegląd Geogr.* **2015**, *87*, 5–25. [CrossRef]
35. Audyt Krajobrazowy Województwa Wielkopolskiego. Projekt. Wielkopolskie Biuro Planowania Przestrzennego. Available online: https://wbpp.poznan.pl/72/audyt-krajobrazowy-wojewodztwa-wielkopolskiego.html (accessed on 18 January 2023).
36. Solon, J.; Borzyszkowski, J.; Bidłasik, M.; Richling, A.; Badora, K.; Balon, J.; Brzezińska-Wójcik, T.; Chabudziński, Ł.; Dobrowolski, R.; Grzegorczyk, I.; et al. Physico-Geographical Mesoregions of POLAND: Verification and Adjustment of Boundaries on the Basis of Contemporary Spatial Data. *Geogr. Pol.* **2018**, *2*, 143–170. [CrossRef]
37. Hładyłowicz, K.J. Zmiany krajobrazu i rozwój osadnictwa w Wielkopolsce od XIV do XIX wieku. *Bad. z DziejówSpołecznych I Gospod.* **1932**, *12*, 1–256.
38. Strzemski, M. Znaczenie badań z zakresu historii kultury materialnej dla poznania tła przeobrażeń stosunków przyrodniczych w Wielkopolsce i na Kujawach. *Zesz. Probl. Post. Nauk Roln.* **1956**, *7*, 7–11.
39. Puckalanka, U. Zasięg Gopła i jego połączenie w naszej erze. *Przegl. Zach.* **1952**, *12*, 575–584.
40. Falkowski, M.; Karłowska, G. Rys historyczny przebiegu gospodarki łąkowo-pastwiskowej w dolinie rzeki Noteci I jej dopływów. *Roczn. Nauk Roln.* **1957**, *72*, 431–558.
41. Chmiel, J.; Kupczyk, M. Stan poznania przyrody Nadgoplańskiego Parku Tysiąclecia i jego najcenniejsze walory. *Stud. Lednickie* **1996**, *IV*, 29–38. Available online: https://bazhum.muzhp.pl/media/files/Studia_Lednickie/Studia_Lednickie-r1996-t4/Studia_Lednickie-r1996-t4-s29-38/Studia_Lednickie-r1996-t4-s29-38.pdf (accessed on 18 January 2023).
42. Chmiel, J. Refuges of forest species in the agricultural landscape (exemplified by the Gniezno Lake District). In *Phytocoenosis Supplementum Cartographiae Geobotanicae 9. Synanthropization of Plant Cover in New Polish Research*; Faliński, J.B., Adamowski, W., Jackowiak, B., Eds.; Antiquariat Bookfarm: Löbnitz, Germany, 1998; Volume 9, pp. 229–236.

43. Chmiel, J. Chosen aspects of synanthropization and protection of the Flora of the Nadgoplański Millennium Park. *Publ. Dep. Plant Taxon. Adam Mickiewicz Univ. Poznań* **2000**, *10*, 201–216.
44. Zemanek, B. Flora roślin naczyniowych Bieszczadzkiego Parku Narodowego—Waloryzacja i ochrona gatunków rzadkich i zagrożonych. *Roczn. Bieszcz.* **1995**, *4*, 51–253.
45. Jackowiak, B. Struktura przestrzenna dużego miasta. Studium metodyczno-problemowe. *Pr. ZakładuTaksonomii Roślin UAM w Pozn.* **1998**, *8*, 1–227.
46. Chmiel, J. Zróżnicowanie przestrzenne flory jako podstawa ochrony przyrody w krajobrazie rolniczym. *Pr. Zakładu Taksonomii Roślin UAM w Pozn.* **2006**, *14*, 1–250.
47. Swink, F.; Wilhelm, G. *Plants of the Chicago Region*, 3rd ed.; The Morton Arboretum: Lisle, IL, USA, 1979. Available online: https://conservationresearchinstitute.org/files/history/plants_of_the_chicago_region.pdf (accessed on 10 November 2022).
48. Ladd, D. *The Missouri Floristic Quality Assessment System*; The Nature Conservancy: St. Louis, MO, USA, 1993.
49. Ladd, D.; Thomas, J.R. Ecological checklist of the Missouri flora for floristic quality assesment, Phytoneuron2015, 12, 1–274. Available online: https://www.phytoneuron.net/2015Phytoneuron/12PhytoN-MissouriFlora.pdf (accessed on 18 January 2023).
50. Taft, J.B.; Wilhelm, G.D.; Ladd, D.M.; Masters, L.A. Floristic Quality Assessment for vegetation in Illinois, a method for assessing vegetation integrity. *Erigenia* **1997**, *15*, 1–24. Available online: https://wwv.inhs.illinois.edu/files/5413/4021/3268/Wilhelm_Illinois_FQA.pdf (accessed on 10 November 2022).
51. Matthews, J.W.; Tessene, P.A.; Wiesbrook, S.M.; Zercher, B.W. Effect of area on isolation on species richness and indices of floristic quality in Illinois, USA wetlands. *Wetlands* **2005**, *25*, 607–615. [CrossRef]
52. Zinnen, J.; Spyreas, G.; Zaya, D.N.; Matthews, J.W. Niche ecology in Floristic Quality Assessment: Are species with higher conservatism more specialized? *Ecol. Indic.* **2021**, *121*, 107078. [CrossRef]
53. Spyreas, G. Scale and sampling effects on Floristic Quality. *PLoS ONE.* **2016**, *11*, e0160693. [CrossRef] [PubMed]
54. Spyreas, G. Floristic Quality Assessment: A critique, a defense, and a primer. *Ecosphere* **2019**, *10*, e02825. [CrossRef]
55. Bauer, J.T.; Kozioł, L.; Bever, J. Ecology of Floristic Quality Assessment: Testing for correlations between coefficients of conservatism, species traits and mycorrhizal responsiveness. *AOB Plants* **2018**, *10*, plx073. [CrossRef]
56. Bried, J.T.; Jog, S.K.; Matthews, J.W. Floristic quality assessment signals human disturbance over natural variability in a wetland system. *Ecol. Indic.* **2013**, *34*, 260–267. [CrossRef]
57. Herman, K.D.; Masters, L.A.; Penskar, M.R.; Reznicek, A.A.; Wilhelm, G.S.; Brodovich, W.W.; Gardiner, K.P. *Floristic Quality Assessment with Wetland Categories and Examples of Computer Applications for the State of Michigan*, 2nd ed.; Michigan Department of Natural Resource, Wildlife Division, Natural Heritage Program: East Lansing, MI, USA, 2001. Available online: https://www2.dnr.state.mi.us/publications/pdfs/HuntingWildlifeHabitat/FQA.pdf (accessed on 10 November 2022).
58. Chu, S.; Molano-Flores, B. Impacts of agricultural to urban land-use change on Floristic Quality Assessment indicators in Northeastern Illinois wetlands. *Urban Ecosyst.* **2013**, *16*, 235–246. [CrossRef]
59. Cohen, M.J.; Carstenn, S.; Lane, C.R. Floristic quality indices for biotic assessment of depressional marsh condition in Florida. *Ecol. Appl.* **2004**, *14*, 784–794. [CrossRef]
60. Nichols, S.A. Floristic Quality Assessment of Wisconsin Lake Plant Communities with Example Applications. *Lake Reserv. Manag.* **1999**, *15*, 133–141. [CrossRef]
61. Jackowiak, B. Antropogeniczne przemiany flory roślin naczyniowych Poznania. *Wyd. Nauk. UAM* **1990**, *42*, 1–232.
62. Thellung, A. Pflanzenwanderungen unter dem Einfluss des Menschen. *Engler Bot. Jahrb.* **1915**, *116*, 37–68.
63. IUCN. 2021; The IUCN Red List of Threatened Species. Available online: https://www.iucnredlist.org/search (accessed on 10 November 2022).
64. Zając, A.; Zając, M. (Eds.) *Atlas Rozmieszczenia Roślin Naczyniowych w Polsce*; Institute of Botany University of Jagielloński: Kraków, Poland, 2001; pp. 1–715.
65. Dušek, R.; Popelková, R. Theoretical view of the Shannon Index in the Evaluation of Landscape Diversity. *Acta Univ. Carolinae. Geographica. Univerzita Karlova* **2012**, *47*, 5–13. [CrossRef]
66. Mirek, Z.; Piękoś-Mirkowa, H.; Zając, A.; Zając, M. *Vascular Plants of Poland: An Annotated Checklist*; W. Szafer Institute of Botany, Polish Academy of Sciences: Kraków, Poland, 2020; pp. 1–526.
67. Phillips, A. The nature of cultural landscapes—A nature conservation perspective. *Landsc. Res.* **1998**, *23*, 21–38. [CrossRef]
68. Szwed, W.; Ratyńska, H.; Danielewicz, W.; Mizgajski, A. *Przyrodnicze Podstawy Kształtowania Marginesów Ekologicznych w Wielkopolsce*; Wydawnictwo Katedry Botaniki Leśnej w Poznaniu: Poznań, Poland, 1999; pp. 1–144.
69. Loh, J.; Harmon, D. A global index of biocultural diversity. *Ecol. Indic.* **2005**, *5*, 231–241. [CrossRef]
70. Cohen, M.; Bilodeau, C.; Alexandre, F.; Godron, M.; Andrieu, J.; Grésillon, E.; Garlatti, F.; Morganti, A. What is the plant biodiversity in a cultural landscape? A comparative, multi-scale and interdisciplinary study in olive groves and vineyards (Mediterranean France). *Agric. Ecosyst. Environ.* **2015**, *212*, 175–186. [CrossRef]
71. Baiamonte, G.; Domina, G.; Ramondo, F.M.; Bazan, G. Agricultural landscapes and biodiversity conservation: A case study in Sicily (Italy). *Biodivers. Conser.* **2015**, *24*, 3201–3216. [CrossRef]
72. Roschewitz, I.; Gabriel, D.; Tscharntke, T.; Thies, C. The effects of landscape complexity on arable weed species diversity in organic and conventional farming. *J. Appl. Ecol.* **2005**, *42*, 873–882. [CrossRef]
73. Gonthier, D.J.; Ennis, K.K.; Farinas, S.; Hsieh, H.-Y.; Iverson, A.L.; Batáry, P.; Rudolphi, J.; Tscharntke, T.; Cardinale, B.J.; Perfecto, I. Biodiversity conservation in agriculture requires a multi-scale approach. *Proc. R. Soc. B* **2014**, *281*, 20141358. [CrossRef]

74. Tilman, D.; Fargone, J.; Wolff, B.; D'Antonio, C.; Dobson, A.; Howarth, R.; Schindler, D.; Schlesinger, W.H.; Simberloff, D.; Swackhamer, D. Forecasting agriculturally driven global environmental change. *Science* **2001**, *292*, 281–284. [CrossRef]
75. Baum, S.; Weih, M.; Busch, G.; Kroiher, F.; Bolte, A. The impact of Short Rotation Coppice plantations on phytodiversity. Landbauforschung—vTI. *Agric. For. Res.* **2009**, *3*, 163–170. Available online: https://scholar.google.com/scholar_lookup?title=The+impact+of+Short+Rotation+Coppice+plantations+on+phytodiversity.+Landbauforsch&author=Baum,+S.&author=Weih,+M.&author=Busch,+G.&author=Kroiher,+F.&author=Bolte,+A.&publication_year=2009&journal=Vti+Agric.+For.+Res.&volume=3&pages=163%E2%80%93170 (accessed on 27 December 2022).
76. Brockerhoff, E.G.; Jactel, H.; Parrotta, J.A.; Quine, C.P.; Sayer, J. Plantation forests and biodiversity: Oxymoron or opportunity? *Biodivers. Conserv.* **2008**, *17*, 925–951. [CrossRef]
77. Phalan, B.; Onial, M.; Balmford, A.; Green, R.E. Reconciling Food Production and Biodiversity Conservation: Land Sharing and Land Sparing Compared. *Science* **2011**, *333*, 1289–1291. [CrossRef]
78. Hanspach, J.; Loos, J.; Dorresteijn, I.; Abson, D.J.; Fischer, J. Characterizing social–ecological units to inform biodiversity conservation in cultural landscapes. *Biodivers. Distrib.* **2016**, *22*, 853–864. [CrossRef]
79. Beilin, R.; Lindborg, R.; Stenseke, M.; Pereira, H.M.; Llausàs, A.; Slätmo, E.; Cerqueira, Y.; Navarro, L.; Rodrigues, P.; Reichelt, N.; et al. Analysing how drivers of agricultural land abandonment affect biodiversity andcultural landscapes using case studies from Scandinavia, Iberia and Oceania. *Land Use Policy* **2014**, *36*, 60–72. [CrossRef]
80. Wania, A.; Kuhn, I.; Klotz, S. Plant richness patterns in agricultural and urban landscapes in Central Germany—Spatial gradients of species richness. *Landsc. Urban Plan.* **2006**, *75*, 97–110. [CrossRef]
81. Pyšek, P. Alien and native species in Central European urban floras. A quantitative comparison. *J. Biogeogr.* **1998**, *25*, 155–163. [CrossRef]
82. Fleishman, E.; Noss, R.F.; Noon, B.R. Utility and limitations of species richness metrics for conservation planning. *Ecol. Indic.* **2006**, *6*, 543–553. [CrossRef]
83. Reemts, C.M.; Eidson, J.A. Choosing Plant Diversity Metrics: A Tallgrass Prairie Case Study. *Ecol. Restor.* **2019**, *37*, 233–245. [CrossRef]
84. Heywood, V.H.; Iriondob, J.M. Plant conservation: Old problems, new perspectives. *Biol. Conserv.* **2003**, *113*, 321–335. [CrossRef]
85. Brudvig, L.A.; Damschen, E.I.; Tewksbury, J.J.; Douglas, J.; Levey, D.J. Landscape connectivity promotes plant biodiversity spillover into non-target habitats. *Biol. Sc.* **2009**, *06*, 9328–9332. [CrossRef]
86. Tscharntke, T.; Klein, A.M.; Kruess, A.; Steffan-Dewenter, I.; Thies, C. Landscape perspectives on agricultural intensification and biodiversity: Ecosystem service management. *Ecol. Lett.* **2005**, *8*, 857–874. [CrossRef]
87. Jog, S.; Kindscher, K.; Questad, E.; Foster, B.; Loring, H. Floristic Quality as an Indicator of Native Species Diversity in Managed Grasslands. *Nat. Areas J.* **2006**, *26*, 149–167. [CrossRef]