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Checklist of the Vascular Flora of Page County, Iowa

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The vascular flora of Page County, Iowa, was studied from 1987 through 1991. Seven hundred forty two species and four hybrids of vascular plants were found. A quarter of the flora consists of non-native species. Taxa not previously reported in Iowa include: *Amsinckia intermedia*, *Brassica kaber*, *Cardaria chalapensis*, *Callirhoe bushii*, *Carex mesochorea*, *Eleocharis xyridiformis*, *Euphorbia prostrata*, *Lactuca saligna*, *Leontodon autumnalis*, *Scirpus mucronatus*, *Sclerochloa dura*, and *Vernonia arkansana*.

Page County, Iowa, has its western boundary 20 miles (32 kilometers) east of the southwest corner of the state. The county is approximately 535 square miles (1385 square kilometers) in extent and approximately square in shape. Topography of the county varies from steep hills (40% slope) with narrow ridge tops in the northeast to gently rolling hills in the west. The elevation varies from 1227 feet (374 meters) in the north central area, to 990 feet (302 m) in the lower reaches of the major rivers. These major drainage systems include the West Nodaway River in the east, the East Nishnabotna River in the northwest corner, and the Tarkio Creeks in the center and south. Although natural wetlands, never common, have been drained, many small man-made farm ponds dot the landscape. The largest is county-owned Pierce Creek Lake, 40 acres (16 hectares) in area.

The major soil associations of Page County are Marshall silty clay loam in the west half and Sharpsburg silty clay loam in the east. Both consist of upland soils derived from loess under prairie vegetation. The Gara-Ladoga soil association, derived from glacial till (Gara loam) or loess (Ladoga silt loam) under savannah, predominates on a ridge which parallels the east side of the Nodaway River. Bedrock is Cretaceous and Pennsylvanian limestone, which is rarely exposed at the surface except in the quarries in the southeast (Clark and McWilliams, 1978).

Since Page County contains no outstanding topographic or botanical features, it has not been the focus of major botanical study in the past. However, it was sampled during larger surveys by Fitzpatrick and Fitzpatrick (1897 and 1898) and Fay (1953). While the county's vegetation was originally approximately 85% prairie and 15% woodland, with some marshes in the floodplains, 91% of the land is now farmed (Varland, 1984), with 58% of the county planted to corn or soybeans (R. Sanson, personal communication).

Recognizing that the county's natural wildlife resources had largely disappeared, the Page County Conservation Board initiated a natural areas inventory in 1982. This work produced a survey of major natural ecosystems (Varland, 1984) and was extended into a more detailed study of Page County vegetation in 1987 through 1989. Results of this second study are reported here.

METHODS

The plant survey was conducted by walking through botanically interesting or representative localities and collecting, photographing, or taking notes on plant species present. Study localities originally included all Page County Conservation Board property and other unusual natural areas identified by the earlier resource inventory (Varland, 1984), but other areas with high quality or unusual habitat types were added during the survey. Study sites visited repeatedly are listed in Table 1. The majority of the survey was conducted in 1987 through 1989, but additional taxa were discovered incidental to other work during 1990 and 1991.

Voucher specimens of most taxa were deposited at the herbarium of University of Nebraska at Omaha (OMA), with duplicates of many

species sent to Iowa State University's Ada Hayden Herbarium (ISC) in Ames, Iowa. Photographs of most species without vouchers are in the possession of the Page County Conservation Board and the author. For a few species, there are no vouchers. Plants lacking vouchers or represented only by photographs are so noted on the checklist.

To ensure accurate identification, many specimens were checked by botanists other than the author. Dr. David Sutherland of University of Nebraska at Omaha examined and corrected many of the specimens, including any the author recognized as potential identification problems. Many of the sedges in the genus *Carex* were checked by Anton A. Reznicek of University of Michigan. Specimens of plants new to the state or representing significant range extensions were sent to the herbarium at Iowa State University for verification, where they were reviewed and corrected by Deborah Lewis, Dean Roosa, and Scott Zager. Some specimens were sent to other people familiar with the taxa: Galen Smith (*Scirpus mucronatus*); Ralph Brooks (*Leontodon autumnalis*); Steve Rolfmeier (*Cardaria chalapensis*); L. J. Dorr (*Callirhoe bushii*). Some specimens were not reviewed by others and any errors, of course, are the responsibility of the author.

Taxonomy follows Great Plains Flora Association (1986) with minor exceptions. Infrasppecific taxa of *Helianthus annuus* and *Sorghum bicolor* follow Heiser (1976) and de Wet (1978), respectively. The current name for *Callirhoe bushii* was supplied by L. J. Dorr. Plants known only from cultivation are excluded from the county flora list. Taxonomy of escapes and waifs (plants growing from discarded seed and not establishing permanent populations in the county) and not listed in Great Plains Flora Association (1986) follows Steyermark (1963) and Bailey et al. (1976).

The checklist is divided into major plant groups, then alphabetized by family and by genus within families. Only plants collected or observed during 1987-1991 are included. The abundance of each taxon is expressed subjectively as common, uncommon, occasional, or rare.

Deciding which introduced species to exclude from the checklist as cultivated was difficult. Any species reproducing on its own, whether by seed or by vegetative means, was included. Individuals intentionally planted were not included. Non-persistent waifs not intentionally planted were included; examples include corn (*Zea mays*) and wheat (*Triticum aestivum*) growing from seed blown from farm trucks and railroad cars, as well as barley (*Hordeum vulgare*) introduced as a contaminant in oats (*Avena fatua* var. *sativa*). When a question arose, the species was included, since some of these escapes may become established members of the county's flora in the future. Long-persistent species such as cultivated roses (*Rosa* spp.), *Allium unifolium* Kellogg, and most cultivated irises (*Iris* spp.), are excluded because they do not seem to spread. *Veronica latifolia* L. collected in a cemetery, was omitted since frequent close mowing prevents assessment of its status. Long-persisting lilac (*Syringa vulgaris* L.) and peony (*Paeonia lactiflora* Pall.) represent more difficult cases. Neither spreads to any significant degree, but lilacs send up suckers next to parent bushes. Peonies were found growing on a roadside adjacent to a commercial peony farm, where they may represent waifs fallen from trucks or

Table 1. Major collecting localities in Page County

Name	Location	Principle Habitats	Owner
Braddyville Access	T-67N, R-36W, Sec. 30	Sandbar, willow thickets	City of Braddyville
Barlow property	T-67N, R-36W, Sec. 15	Rich woods on slope	Denzel Barlow
Grove Cemetery	T-67N, R-37W, Sec. 7	Upland tallgrass prairie, disturbed areas, hedgerow	City of College Springs
Hawleyville Cemetery	T-69N, R-36W, Sec. 13	Disturbed tallgrass prairie	Nebraska Township Trustees
Highway 2 right-of-way	T-69N, R, 39W, Sections 28 & 33 through T-69N, R-37W, Sec. 26 & 35	Mostly old field, some prairie and disturbed areas	Iowa Department of Transportation
Loutzenhiser property	T-70N, R-36W, Sec. 24	Upland forest and pasture	Bobby Loutzenhiser
McAlpin property	T-70N, R-36W, Sec. 24	Upland forest and pasture	William McAlpin
Miller farm	T-68N, R-38W, Sec. 22	Cultivated field, floodplain pasture, woods	Joy Miller
Mount Arbor Nursery	T-69N, R-39W, Sec. 17	Cultivated fields and dump	Mount Arbor Nursery
Nodaway Valley Park	T-69N, R-36W, Sec. 22	Upland woods, brush, meadows	Page County Conservation Board
Palmquist Prairie	T-70N, R-37W, Sec. 20	Disturbed tallgrass prairie	Gerhardt Palmquist
Pierce Creek Park	T-70N, R-39W, Sec. 29	Meadows, lake, woods, disturbed areas, hedgerows	Page County Conservation Board
Pioneer Park	T-69N, R-38W, Sec. 28	Mowed grass, pond, woods, hedgerow	Page County Conservation Board
Ross Park	T-67N, R-36W, Sec. 15	Abandoned limestone quarry, farmstead	Page County Conservation Board
Stevens Tract	T-70N, R-36W, Sec. 20	Marsh, willow thicket, old field	Page County Conservation Board
Wabash Trace Nature Trail	T-69N, R-39W, Sec. 7 through T-67N, R-38W, Sec. 28	Railroad right-of-way; disturbed areas, old fields, prairie, thickets	S. W. Iowa Nature Trail Foundation and Iowa Natural Heritage Foundation
Wise pasture	T-67N, R-37W, Sec. 13	Upland pasture with sandy soil	Lester Wise

discarded. While the annuals *Cucurbita maxima* Dcne., *C. pepo* L., and *Brassica rapa* L. were collected in garbage dumps during this survey and may grow wherever vegetable waste is deposited, they are not included on the list.

RESULTS

Weather was unusual during each year of the survey. 1987 was abnormally wet with much flooding. 1988 was a drought year, and 1989 was drier than normal though not as dry as 1988. Dryness may have prevented some species from growing sufficiently to be observed. Winters preceding all three growing seasons were mild, with little snow and no extended periods of very low temperatures. Mild winter weather appeared to allow some species, particularly those at the northern edge of their range, to build up larger populations than had been typical.

Seven hundred fifty five taxa of native, naturalized, or escaped plants were collected or observed in Page County during 1987-1989 (see appendix); the list includes 742 species, 9 varieties, and 4 hybrids in 376 genera of 108 families. This compares to 174 species reported by Fitzpatrick and Fitzpatrick (1897 and 1898) and 405 species reported by Fay (1953). The greater number found in the present study reflects in part a greater amount of time spent searching the county. To provide some historical perspective, species reported by Fitzpatrick and Fitzpatrick (1897 and 1898) and Fay (1953) are noted in the appendix.

Five hundred thirty nine (72%) of the plant taxa located during this survey are native to the area, and 210 (28%) are introduced. This percentage does not fully convey the importance of introduced species, since our single most abundant perennial is probably introduced smooth brome (*Bromus inermis*), while introduced annuals dominate as both weeds and crops in extensive, cultivated fields. On the other hand, many of the native species are locally rare.

The majority of plant taxa found are perennials, and a higher percentage of native than introduced species are perennial (Table 2).

Introduced species are predominantly plants of disturbed habitats, and such plants are often annuals. While more than two-thirds of the species growing in such open, sunny habitats as pastures, meadows, and prairies are native, the great majority of individuals observed are introduced. Native species predominate overwhelmingly in forests and wetlands.

Table 2. Comparing the growth types and habitats of the 755 native and introduced Page County plant taxa.

Growth type and Habitat	Native		Introduced		Total	
	No.	% of Native Taxa	No.	% of Intro. Taxa	No.	% of All Taxa
Growth type:¹						
Annuals	108	20%	91	43%	198	26%
Biennials	22	4%	33	16%	55	7%
Perennials	432	79%	95	52%	539	71%
Habitat:²						
Disturbance	92		127		219	29%
Old Field & Prairie	211		82		290	38%
Thicket	62		28		90	12%
Forest	159		5		162	22%
Wetland	125		8		127	17%

1 Several species can be classified in two or all three growth categories, so the total is greater than the number of species known in the county.

2 Some species can grow in more than one habitat, so these categories total more than the number of species known from the county.

A comparison of Page County's flora with recently published floras for counties from the four corners of the state shows a clear decrease in diversity in the state from east to west with the northwest the least diverse and the northeast very diverse (Table 3). The published checklist for Fremont County (Peck et al., 1978), adjacent to Page County on the west, includes only 550 taxa but is clearly incomplete since it lacks many widespread and escaped species. Fremont County, however, does include many species absent from Page County, mainly those of steep loess-bluff prairies, deep wooded ravines, and large marshes, which are topographic features lacking in Page County. Because of greater topographic heterogeneity, Fremont County's known flora can eventually be expected to exceed that of Page County.

Taxonomic Problems

Certain plants presented taxonomic problems. The correct name for the crabgrass listed here as *Digitaria ciliaris* is in doubt (Sutherland, 1986). The mountain mint is listed as *Pycnanthemum virginianum* since leaf shape matches that species, but many individuals have the stems more or less glabrous and key to *P. tenuifolium* Schrad. in various references. Such individuals may be the reason that the latter species was previously reported from this area. Collected specimens of *Sorghum bicolor* var. *drumondii* include both weedy shattercane and waifs of cultivated Sudan grass. A woodland sunflower with a rough stem appears to be a well-defined form here, but the appropriate name has been a matter of controversy. I have listed it as *Helianthus strumosus*, but other local studies have treated it differently; Garabrandt (1988) considered it to be depauperate *H. tuberosus* and Rolfsmeier (1989) called it *H. cf. hirsuta*.

Rare Plants

Several unexpected species were found during this study. These included species endangered or otherwise of special interest in Iowa, plants not previously reported from the state, and significant extensions of the known Iowa ranges of other species. Voucher specimens for all these species are deposited in OMA.

The survey located eight rare species of special interest in Iowa. About 3000 plants of Endangered *Callirhoe alcaeoides* were found, all along Highway 2 except for about 25 individuals along the Wabash Trace Nature Trail. Previous records were from Dickinson County (Roosa et al., 1989), but no extant Iowa populations are known outside Page County. Some plants were identified by Anton A. Reznicek as the Endangered sedge *Carex aggregata*. This species has been reported from Iowa previously from Allamakee and Story Counties (Roosa et al., 1989). Dr. Reznicek views this as a common, somewhat weedy species (Reznicek, pers. comm.). Perhaps its endangered status in Iowa is the result of misidentification, rather than rarity. Endangered *Schedonnardus paniculatus* occupies a small area in the right-of-way of Highway 2 and a forty-acre pasture along the same road. Reported recently from four other counties in extreme western Iowa (Roosa et al., 1989), this species is a common weed in the Great Plains. A fifteen-foot patch of Endangered *Buchlœ dactyloides* grows along the entrance road to Noda-

way Valley Park; while not intentionally planted, it is probably not native at that site. One clone of Threatened *Diospyros virginiana* produces sprouts, bushes, and small trees along a fencerow in Section 25, T70N, R36W, but does not set fruit, and may have spread from cultivated plants. One rosette of Threatened *Rorippa sinuata* was collected on a sandbar of the Nishnabotna River and identified by Phillip Moore (see Moore, 1990). The species was known from nine widely spread counties in Iowa, with recent records all from western Iowa (Roosa et al., 1989). Two plants of *Baptisia australis*, a species categorized as being of special concern to the Department of Natural Resources, grew in the right-of-way of Highway 2. Previous records were from Howard County (Roosa et al., 1989), unexpected since the species range lies south of Iowa (Gleason, 1952). No existing wild populations are known from Iowa outside Page County. A small population of *Geum vernum*, once believed extirpated from the state (Roosa et al., 1989), was located along a wooded creek in Section 22, T68N, R38W.

New State Records

This survey also identified 23 species and a hybrid not included in the checklist of Iowa plants being compiled by Eilers and Roosa (1989). While most of these plants are new to the state, some new records reflect changes in the taxonomy rather than the distribution of Iowa's plants. *Ammannia robusta* and *Calystegia macounii* have recently been segregated from *A. coccinea* and *C. sepium*, respectively, and no doubt have always been present. The hybrid *Verbena* × *illicita* (*V. stricta* × *V. urticifolia*) was collected from a disturbed old field in Pierce Creek Park.

Most of the Page County species not included in Eilers and Roosa (1989) are escaped or locally spreading cultivated species, including *Allium fistulosum*, *Allium sativum*, *Iris pseudacorus*, *Lathyrus japonicus*, *Lonicera japonica*, *Muscari botryoides*, *Papaver orientale*, *Papaver somniferum*, and *Scilla sibirica*. While most of these are only transitory members of Page County's flora, *Iris pseudacorus*, *Lonicera japonica*, and *Muscari botryoides* seem relatively well established.

The remaining twelve species not reported previously from Iowa are probably new, or at least newly recognized, in the state. Two plants of *Amsinckia intermedia* were found by Ken Crouch in a newly seeded lawn in Clarinda. Plants of the Pacific Northwest, they had apparently been introduced as contaminants in grass seed. *Brassica kaber* is a weed in alfalfa fields. Six plants of *Callirhoe bushii* grow at one location on Highway 2 between Clarinda and Shenandoah. Since the nearest known location for this species seems to be in central Missouri (Steyermark, 1963), it is probably not native to Page County although growing among native prairie species. *Cardaria chalapensis* closely resembles *C. draba*; pubescence of the lower stem, a character sometimes used to segregate the two, is highly variable and not well correlated with the defining differences in the silicles (Rolfsmeier, pers. comm.), so the species has been overlooked. Anton Reznicek identified as *Carex mesochorea* a sedge growing in the prairie restoration at Pierce Creek Park. Plants growing there may have originated from seed present in the field before the restoration, locally collected seed, or

Table 3. Comparison of flora lists from counties in the four corners of Iowa

County	Corner of Iowa	# of taxa reported	# of genera	# of families	Introduced taxa	% of taxa introduced	Reference
Allamakee	NE	1040	444	124	56	15%	Peck et al., 1980
Des Moines	SE	806	393	109	143	18%	Lammers, 1983
Lee	SE	876	437	114	154	18%	Peck et al., 1981
Lyon	NW	561	288	88	102	18%	Peck et al., 1984
Sioux	NW	506	280	86	106	21%	Peck et al., 1984
Fremont	SW	550	297	97	74	13%	Peck et al., 1978
Page	SW	755	376	108	210	28%	this study

purchased seed. *Eleocharis xyridiformis*, usually found west or southwest of Iowa, was common in a pond south of Ross Park in Section 15, T67N, R36W. *Euphorbia prostrata* is an uncommon but widespread weed in southwest Iowa (pers. obs.), similar to *E. maculata*. *Lactuca saligna* is a rare weed in overgrazed pasture. *Leontodon autumnalis* was collected once in a mowed grassy area in Pierce Creek Park. A population of *Sclerochloa dura* has persisted at the fairgrounds in Clarinda from at least 1987 through 1991, and appeared more common in 1991 than in previous years. This northwestern species has only recently been recognized as widespread in Kansas and established in Nebraska (Brandenburg et al., 1991, Sutherland, pers. comm.). *Scirpus mucronatus* was collected at the pond in Section 15, T67N, R36W, with *Eleocharis xyridiformis*. A large population of the *Scirpus* was established at that pond, and a few plants were also found at each of the two ponds in Ross Park itself. Though long known from both coasts, this Eurasian species is newly recognized in the Midwest, where specimens have been collected from eastern Missouri and Illinois (Galen Smith and George Yatskievych, pers. comm.). One plant of *Vernonia arkansana* grows in the right-of-way of Highway 2, 0.1 mile west of Norwich. With the exception of *Euphorbia prostrata* and perhaps *Callirhoe bushii*, all these newly reported species are introduced in Iowa.

Range Extensions

Other Page County records represent significant extensions of certain plants' known Iowa range. The known ranges cited here are from Eilers and Roosa (1989). *Carex artitecta* was considered rare in the southeast but also found in the lakes area. *Carex bushii* was known only from Davis, Lee, and Wapello Counties in southeastern Iowa. *Carex emoryi* was known from the lakes area and the paleozoic plateau. The population of the hybrid grass \times *Elybordeum iowense* found in Page County represents only the second known population (Pohl, annotations on specimen at ISC); the other is located in Story County (Pohl, 1966). *Hieracium longipilum* was known from the eastern half of the state. *Monolepis nuttalliana* had been reported previously only from Story County in 1917. *Muhlenbergia bushii* has been considered a rare species of southeast Iowa. *Opuntia macrorhiza* was listed only from Allamakee, Guthrie, and Polk Counties. *Paspalum setaceum* var. *muhlenbergii* was considered rare in the southeast half of the state. *Pyrrochloa caroliniana* had been reported only once before, from Jefferson County. *Rorippa austriaca* grows in large beds in wet road ditches along Highway 59 just north of Shenandoah. Although its seed is abortive, the species is spreading along rivers in southwest Iowa (pers. obs.) and Nebraska (Sutherland, pers. comm.). Iowa State University has specimens from Story and Emmet Counties (Farrar, pers. comm.). *Rosa setigera* was considered a rare species of southeast Iowa. *Rubus idaeus* is a rare escape from cultivation in the north central and extreme eastern parts of the state. While established at only one Page County site, it is spreading aggressively there. *Sisymbrium loeselii* was considered rare in Iowa and reported from five Iowa counties, though it is a common weed in the Omaha area (pers. obs.). The only previous Iowa specimen of *Triodanis leptocarpa* in the herbarium at Iowa State University was collected in Winnibago County in 1923 (Roosa, pers. comm.). *Wolffia borealis* had been reported only from the northeast half of Iowa.

The discovery of so many plants previously unknown in Iowa, rare in the state, or far from their known Iowa range, suggests that much remains to be learned about Iowa's flora. These plants may have been previously overlooked for two reasons. First, most Iowa botanists live in central or eastern Iowa and this inevitably biases their collecting efforts, despite recent Natural History Forums and other projects designed to bring field biologists to all parts of the state. Also, botanists living in central and eastern Iowa have not recognized the importance of the herbarium at University of Nebraska at Omaha since it is located outside Iowa, if only by twenty miles. Botanists working

in southwest Iowa have often deposited their specimens at that herbarium, which is conveniently located for their research, and it contains numerous significant records of southwest Iowa plants.

Effect of Highway 2 on Flora

Highway 2, the main east-west highway through Page County, has had an important impact on the county's floristics in two ways. First, it preserves locally rare prairie species in the area between Clarinda and Shenandoah. Some adjacent fields were native pastures or hay meadows into the early 1970's (Dennis Mier, pers. comm.). When the roadside was last rebuilt, in the 1930's, native species colonized the right-of-way from such meadows. Prairie species present are listed in Table 4.

The value of Highway 2 as a refuge for prairie plants will decline rapidly during 1991 and following years, when the right-of-way will be graded, widened, and rebuilt to meet current safety standards. Since the prairie plant communities that provided a seed source for colonization of the right-of-way following early road construction have since been destroyed by agricultural activities, prairie plants will not return on their own. *Baptisia australis*, *Callirhoe bushii*, *Penstemon digitalis*, and *Psoralea tenuifolia* are found in Page County only along this stretch of road, while the vast majority of the *Callirhoe alcaeoides* grow there as

Table 4. Prairie plant species growing along Highway 2 in Page County.

<i>Andropogon gerardii</i>	<i>Coreopsis palmata</i>	<i>Ratibida pinnata</i>
<i>Anemone canadensis</i>	<i>Dichanthelium</i>	<i>Rosa arkansana</i>
<i>Artemisia ludoviciana</i>	<i>oligosanthes</i> var.	<i>Rudbeckia hirta</i>
<i>Baptisia australis</i>	<i>scribnerianum</i>	<i>Ruellia humilis</i>
var. <i>minor</i>	<i>Echinacea pallida</i>	<i>Silphium integrifolium</i>
<i>Baptisia bracteata</i>	<i>Erysimum inconspicuum</i>	<i>Silphium laciniatum</i>
<i>Baptisia lactea</i>	<i>Euphorbia corollata</i>	<i>Tripsacum dactyloides</i>
<i>Bouteloua curtipendula</i>	<i>Heliopsis helianthoides</i>	<i>Veronicastrum</i>
<i>Carex bicknellii</i>	<i>Lithospermum canescens</i>	<i>virginicum</i>
<i>Carex meadii</i>	<i>Panicum virgatum</i>	<i>Viola pedatifida</i>
<i>Callirhoe alcaeoides</i>	<i>Psoralea tenuifolia</i>	

well. Efforts are being made to preserve populations of the rare plants by collecting seed and transplanting existing plants to protected county property in Pierce Creek and Nodaway Valley Parks.

Highway 2 is also important as a corridor along which seeds travel on vehicles, from which they may disperse and become established in the county. Plants apparently introduced in this way include: *Carex praegracilis*, perhaps *Callirhoe bushii*, *Eriochloa villosa*, *Grindelia squarrosa*, *Gutierrezia dracunculoides*, *Helianthus annuus* var. *macrocarpa*, *Paspalum setaceum* var. *muhlenbergii*, *Schedonnardus paniculatus*, *Silene cserei*, *Sorghum bicolor* (both milo and shattercane), *Sorghum halepense*, *Vernonia arkansana*, and many waifs of *Zea mays*. More common species are likely dispersing along the highway as well, though such dispersal is difficult to detect in widespread plants.

Plant Losses

Major and recent floras that include southwest Iowa list 46 Page County species that could not be relocated during this survey (Table 5). Some of the species reported in the past but not collected during this survey are rare weeds or plants that rarely escape cultivation; they might be present or absent from the county at any time. Others are cultivated plants that do not spread.

Other species are so similar to more common plants that they might have been overlooked, though in most cases the more common species were collected repeatedly in an effort to locate their rarer look-alikes. Such species may have been extirpated or may have been misidentified

Table 5. Plants previously reported from Page County but not found during this study.

Species	Source ¹	Comment
Probably Extirpated		
<i>Aster sericeus</i> Vent.	3	Prairie habitat
<i>Astragalus distortus</i> T. & G.	1, 4	Prairie habitat
<i>Carya tomentosa</i> Nutt.	1, 4	Forest
<i>Cypridedium candidum</i> Muhl. ex Willd.	1, 2, 4	Moist prairie habitat
<i>Fragaria vesca</i> L. var. <i>americana</i> Porter	1, 2, 4	Woodland
<i>Nasturtium officinale</i> R. Br.	1, 4, 5	Cool, clear streams
<i>Zizania aquatica</i> L.	3, 4	Marsh habitat
Waifs, Cultivated Forms, and Rare Weeds		
<i>Achillea millefolium</i> L. var. <i>millefolium</i>	2	Cultivated
<i>Alopecurus pratensis</i> L.	1	Rare annual grass
<i>Arrhenatherum elatius</i> (L.) Presl.	1, 4	
<i>Belamcanda chinensis</i> (L.) DC.	1, 3, 4	Escapes cultivation nearby
<i>Corydalis aurea</i> Engelm.	2	Like <i>C. micrantha</i> but rare
<i>Echium vulgare</i> L.	1, 4	
<i>Fagopyrum esculentum</i> Moench	1, 3, 4	Cultivated; waif on railroad
<i>Galinsoga quadriradiata</i> R. & P.	1	<i>G. parviflora</i> is a rare weed
<i>Phlox subulata</i> L.	1	Cultivated; does not spread
<i>Prunus persica</i> L.	3	Cultivated; does not spread
<i>Ranunculus acris</i> L.	1, 4	
<i>Raphanus sativus</i> L.	1, 4	Cultivated
<i>Setaria italica</i> (L.) Beauv.	1, 3	Cultivated
<i>Spiraea salicifolia</i> L.	3	Cultivated; does not spread
Similar to Species Found		
<i>Aster sagittifolius</i> Willd.	1, 4	Like <i>A. drummondii</i>
<i>Carex stricta</i> Lam.	1, 4, 5	Like <i>C. emoryii</i>
<i>Carex vesicaria</i> L. var. <i>monile</i> (Tuckerm.) Fern.	1, 4, 6	Like <i>C. laeviconica</i>
<i>Cystopteris fragilis</i> (L.) Bernh.	1, 3, 4	Like <i>C. protrusa</i>
<i>Dichanthelium acuminatum</i> var. <i>villosum</i> (A. Gray) Gould & Clark	1, 4	Specimens of <i>D. a.</i> var. <i>acuminatum</i> approach var. <i>villosum</i>
<i>Eleocharis macrostachya</i> Britt.	1, 4, 6	Like <i>E. erythropoda</i> ; rare
<i>Geum laciniatum</i> Murr.	1, 4	Like <i>G. canadense</i> but rare
<i>Hypericum punctatum</i> Lam.	1, 4	Like <i>H. perforatum</i>
<i>Plantago major</i> L.	1	Like <i>P. rugellii</i> but rare
<i>Salix lutea</i> Nutt.	3	Like <i>S. eriocephala</i>
<i>Setaria verticillata</i> (L.) Beauv.	1, 4	Like <i>S. viridis</i> ; uncommon
Probably Still Present		
<i>Agrimonia parviflora</i> Ait.	3	Found in Taylor County
<i>Agropyron caninum</i> (L.) Beauv. subsp. <i>majus</i> (Vasey) C. L. Hitchc.	1	
<i>Aster ontarionis</i> Wieg.	1, 4, 5	Like <i>A. simplex</i> ; uncommon
<i>Carex crus-corvi</i> Shuttlew. ex. O. Ktze.	1, 4, 6	Marsh habitat
<i>Cinna arundinacea</i> L.	1, 4	Woodland streams
<i>Epilobium paniculatum</i> Nutt. ex T. & G.	4	Wetlands
<i>Euphorbia esula</i> L.	1	Similar to the next
<i>Euphorbia</i> × <i>pseudovirgata</i> (Schur) Soo	4	Increasing in nearby counties
<i>Lathyrus palustris</i> L.	1, 2, 4	Wetlands
<i>Lysimachia hybrida</i> Michx.	1, 4, 5	Wet grassy areas; rare
<i>Ludwigia polycarpa</i> Short & Peter	1, 4, 5	
<i>Myosurus minimus</i> L.	1, 4	Exceedingly inconspicuous
<i>Rumex obtusifolius</i> L.	2	

¹Sources

1 = Fay, 1953

2 = Fitzpatrick and Fitzpatrick, 1897

3 = Fitzpatrick and Fitzpatrick, 1898

4 = Great Plains Flora Association, 1977

5 = Lammers & van der Valk, 1977

6 = Lammers & van der Valk, 1978

Sources checked but not providing additional records:

Niemann, 1986; Peck, 1976, 1980, 1983, and 1989

in the past. Altered species concepts might also account for some of the species not rediscovered. *Cystopteris fragilis*, for example, has been split into several superficially similar species and of these only *C. protrusa* was found during this study. In addition, thirteen more easily recognized species reported in the past may still be present in the county, since their habitat is present and they occur in nearby counties.

Habitat destruction accounts for seven species probably extirpated from the county. Prairie habitat has declined from 85% to 0.006% of the county's land area (Varland, 1984), and is highly fragmented with the largest parcel a mere six acres. Nonetheless, most prairie species reported in the past were relocated during this study. Many prairie species persist in single localities, however, and some even as single plants. All prairie communities and many prairie plant species are endangered at the county level. *Aster sericeus* (Fitzpatrick and Fitzpatrick, 1898), *Astragalus distortus* (Fay, 1953, and Great Plains Flora Association, 1977), and *Cypripedium candidum* (Fitzpatrick and Fitzpatrick, 1897, and Great Plains Flora Association, 1977) are three prairie species that may have been extirpated.

Woodland habitat has declined less severely, from 15% to 6% of the county's area (Varland, 1984), but remaining woods have been disturbed by grazing and by the harvesting of wood. Two forest species have been lost, *Carya tomentosa* (Fay, 1953) and *Fragaria vesca* var. *americana* (Fitzpatrick and Fitzpatrick, 1897). Many plants of rich woodlands are scarce and even more patchily distributed in the county than the woodlands themselves. *Nasturtium officinale* (Fay, 1953) has also disappeared, perhaps due to sedimentation or trampling in grazed creeks.

Marsh habitat was never common in Page County and aquatic species seem relatively resistant to extermination. *Zizania aquatica* is the only marsh species lost from Page County, and it may have been introduced in the first place for the purpose of improving waterfowl habitat.

Noxious Weeds

Under Iowa law, certain species are considered noxious weeds that must be controlled (Iowa Code, Section 317; 1991). All thirteen of the secondary noxious weeds and nine of the twelve primary noxious weeds were found. Primary noxious weeds *Centaurea repens* L. and *Euphorbia esula* L. were not found, nor was *E. × pseudovirgata* (Schur) Soo, which closely resembles *E. esula* and seems to account for the southwest Iowa reports of that species (pers. obs.). "*Rhamnus* except *R. frangula*" is listed as a primary noxious weed; perhaps that entry is intended to cover the various cultivars of *Rhamnus cathartica* L., an invasive shrub which was not found during this study. *Rhamnus lanceolata* var. *glabrata* was collected but since that shrub is uncommon and not aggressive it could not reasonably be considered a noxious weed.

Certain weedy plants that have not been a problem in the past are just beginning to invade the county. Two plants of *Lythrum salicaria* were found in 1987 and killed. None were found in subsequent years, but drought rather than successful eradication may explain that. *Sorghum halepense* and *Eriochloa villosa* were found along Highway 2 and in single cultivated fields. *Schedonardus paniculatus*, considered an endangered species in Iowa but a problem weed to our west, grew along Highway 2 and in one heavily grazed pasture adjacent to that road. The population remained unchanged from 1987 through 1991 and how long this species has been present is unknown.

Plants of Uncommon Soils

A line of hills covered by the Gara-Ladoga soil association parallels the Nodaway River, mainly on the east. Since many of its slopes are too steep to cultivate, this ridge contains much of the remaining upland forest in the county, of which none, however, is undisturbed (Varland, 1984). Remaining native vegetation suggests that this ridge was originally covered by prairie and savannah, with pockets of richer

woodland. The scarcity of species associated with moist woodland, such as *Sanguinaria canadense*, *Arisaema dracontium*, *Polygonum virginianum*, and *Asarum canadense*, could be explained by grazing, which has certainly occurred on the ridge and determines species composition of the many woodlots still used by cattle. However, savannah species like *Asclepias purpurea* and prairie species like *Zizia aurea*, *Erythronium mesochoreum*, and *Pedicularis canadensis* grow even in what are now closed-canopy woodlands, suggesting that this woodland was savannah until recently.

Sandy upland soils are scarce in Page County, but where they occur they are associated with uncommon plants. For example, an area of Sparta loamy fine sand atop a hill in Nodaway Valley Park is the only location for *Croton glandulosus* var. *septentrionalis*. *Opuntia macrorhiza* and *Onosmodium molle* and other rare prairie species are growing on smaller patches of sandy soil.

SUMMARY

Page County lacks unusual topological features and is extensively farmed, but its flora remains diverse. Many of the county's plants are confined to small patches of suitable habitat. Efforts to preserve floral diversity should concentrate in such areas, including prairie remnants, those uplands with sandy soil and retaining unusual prairie species, the few woodlands with a great diversity of forest wildflowers, and marshes.

While this checklist is reasonably complete, more species will doubtless be found in the future, especially in floodplain woods and in ponds, two habitats that were collected less intensively than others.

An intensive plant survey such as this one is valuable in several ways. At the county level, it has pinpointed species, habitats, and sites at risk, influencing plans of the Page County Conservation Board. At the state level, it has detected species rare or previously unknown in Iowa, and has extended the known range of others. Comparisons with previous studies provide a historical perspective on Page County's flora (and by inference that of nearby counties), and this study provides a basis for recognizing future changes. Transient members of the flora were detected, as well as early stages of invasions by new species. Unfortunately, the study also reports what are likely to be among the last records of certain native plants that will soon disappear from the county.

ACKNOWLEDGEMENTS

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Flora of Page County

Origin: N = Native; I = Introduced

Abundance: C = Common; U = Uncommon; O = Occasional; R = Rare

* = Photograph only; no herbarium specimen

** = No voucher; sight records only

1 = reported in Fitzpatrick and Fitzpatrick, 1897

2 = reported in Fitzpatrick and Fitzpatrick, 1898

3 = reported as a specimen or sight record in Fay, 1953

4 = Fay, 1953, lists a previous published record other than Fitzpatrick and Fitzpatrick, 1897 or 1898.

PTERIDOPHYTES

Equisetaceae

- Equisetum arvense* L., N, U; 3.
Equisetum × ferrissii Clute, N, C.
Equisetum hyemale L., N, U; 3.
Equisetum laevigatum A. Br., N, C; 3.

Ophioglossaceae

- Botrychium virginianum* (L.) Sw., N, U.

Polypodiaceae

- Adiantum pedatum* L., N, U; 2.
Cystopteris protrusa (Weath.) Blasd., N, C; 2.

GYMNOSPERMS

Cupressaceae

- Juniperus virginiana* L., N, C.

DICOTYLEDONS

Acanthaceae

- Ruellia humilis* Nutt., N, U; 2, 3.
Ruellia strepens L. N, R.

Aceraceae

- Acer negundo* L. var. *violaceum* (Kirchn.) Jaeg., N, C; 1, 3.
Acer saccharinum L., N, C; 3.

Amaranthaceae

- Amaranthus albus* L., N, U; 2.
Amaranthus graecizans L., N, C.
Amaranthus retroflexus L., N(?), C; 2.
Amaranthus rudis Sauer., N, C.

Anacardiaceae

- Rhus aromatica* Ait. var. *serotina* (Greene) Rehd., N, R.

- Rhus glabra* L., N, C; 2, 3.

- Toxicodendron radicans* (L.) O. Ktze. ssp. *negundo* (Greene) Gillis, N, C; 2, 3. *

Apiaceae

- Chaerophyllum procumbens* (L.) Crantz, N, U.
Cicuta maculata L., N, O.
Conium maculatum L., I, U; 3.
Cryptotaenia canadensis (L.) DC., N, U; 3.
Daucus carota L., I, U.
Eryngium yuccifolium Michx., N, R; 2.
Heracleum sphondylium L. ssp. *montanum* (Schleich.) Briq., N, R. **
Osmorhiza longistylis (Torr.) DC. var. *longistylis*, N, C.
Osmorhiza longistylis (Torr.) DC. var. *villicaulis* Fern., N, U.

- Pastinaca sativa* L., I, C; 2, 3.

- Sanicula canadensis* L., N, C.

- Sanicula gregaria* Bickn., N, C.

- Zizia aurea* (L.) Koch., N, U; 2.

Apocynaceae

- Apocynum cannabinum* L., N, C; 3.

Aristolochiaceae

- Asarum canadense* L., N, R; 4.

Asclepiadaceae

- Asclepias amplexicaulis* Sm., N, O. *

- Asclepias incarnata* L., N, U; 2. *

- Asclepias purpurascens* L., N, R.

- Asclepias sullivantii* Engelm., N, U; 2, 3.

- Asclepias syriaca* L., N, C; 3.

- Asclepias tuberosa* L. ssp. *interior* Woods., N, R; 4.

- Asclepias verticillata* L., N, C; 2, 3.

- Asclepias viridiflora* Raf., N, R.

- Cynanchum laeve* (Michx.) Pers., N, C; 3.

Asteraceae

- Achillea millefolium* L. subsp. *lanulosa* (Nutt.) Piper, N, C; 3.

- Ambrosia artemisiifolia* L., N, C; 2, 3.

- Ambrosia psilostachya* DC., N, C.

- Ambrosia trifida* L., N, C; 2, 3.

- Antennaria neglecta* Greene, N, U.

- Antennaria parlinii* Fern., N, U.

- Anthemis cotula* L., I, U; 3.

- Arctium minus* Bernh., N, U; 3.

- Artemisia ludoviciana* Nutt. var. *ludoviciana*, N, U; 2.

- Aster drummondii* Lindl., N, C.

- Aster ericoides* L., N, C; 3.

- Aster falcatus* Lindl., N, R.

- Aster laevis* L., N, O; 3.

- Aster novae-angliae* L., N, O; 3.

- Aster oolentangiensis* Ridd., N, R.
Aster pilosus Willd., N, R
Aster simplex Willd. var. *interior* (Wieg.) Cronq., N, U.
Aster simplex Willd. var. *simplex*, N, C; 3.
Bidens cernua L., N, C.
Bidens comosa (A. Gray) Wieg., N, U.
Bidens frondosa L., N, U.
Bidens polylepis Blake, N, C.
Bidens vulgata Greene, N, U; 4.
Cacalia atriplicifolia L., N, U; 4.
Cacalia plantaginea (Raf.) Shinnery, N, R; 4.
Carduus acanthoides L., I, R.
Carduus nutans L. ssp. *leophyllus* (Petrovic) Stoj. & Stef., I, C; 3.
Centaurea maculosa Lam., I, R.
Chrysanthemum leucanthemum L., I, U; 3.
Cichorium intybus L., I, C; 4.
Cirsium altissimum (L.) Spreng., N, C; 4.
Cirsium arvense (L.) Scop., Canada Thistle. I, O; 3.
Cirsium flodmanii (Rydb.) Arthur, N, R.
Cirsium vulgare (Savi) Ten., I, C.
Conyza canadensis (L.) Cronq., N, C; 2, 3.
Conyza ramosissima Cronq., N, O.
Coreopsis palmata Nutt., N, O; 2, 3.
Coreopsis tinctoria Nutt., I, O.
Crepis tectorum L., I, R.
Dysodia papposa (Vent.) Hitchc., N, C; 2.
Echinacea pallida (Nutt.) Nutt., N, U; 3.
Echinacea purpurea (L.) Moench, I, O.
Erechtites hieracifolia (L.) Raf. ex DC., N, C; 3.
Erigeron annuus (L.) Pers., N, C; 3.
Erigeron philadelphicus L., N, U.
Erigeron strigosus Muhl. ex Willd. var. *strigosus*, N, C; 3.
Eupatorium altissimum L., N, C; 3.
Eupatorium perfoliatum L., N, U.
Eupatorium purpureum L., N, C; 2, 3.
Eupatorium rugosum Houtt., N, C; 3.
Eupatorium serotinum Michx., N, R.
Euthamia gymnosperma Greene, N, O; 3.
Gnaphalium obtusifolium L., N, R.
Grindelia squarrosa (Pursh) Dun., N, R.
Gutierrezia dracunculoides (DC.) Blake, I, R.
Helianium autumnale L., N, U.
Helianthus annuus L. subsp. *annuus*, N, C.
Helianthus annuus L. var. *macrocarpus* (DC.) Ktll., I, R.
Helianthus grosseserratus Martens, N, C; 3.
Helianthus hirsutus Raf., N, R.
Helianthus × *laetiflorus* Pers., N, R.
Helianthus maximiliani Schrad., N, O.
Helianthus mollis Lam., I, R.
Helianthus rigidus (Cass.) Desf. ssp. *rigidus*, N, C; 2.
Helianthus strumosus L., N, U.
Helianthus tuberosus L., N, C; 3.
Heliopsis helianthoides (L.) Sweet var. *scabra* (Dun.) Fern., N, C; 2, 3.
Hieracium longipilum Torr., N, R.
Kubnia eupatorioides L. var. *corymbulosa* T. & G., N, C; 3.
Lactuca canadensis L., N, C; 3.
Lactuca floridana (L.) Gaertn., N, C.
Lactuca ludoviciana (Nutt.) Ridd., N, C.
Lactuca oblongifolia Nutt., N, U; 3.
Lactuca saligna L., I, R.
Lactuca serriola L., I, C; 2, 3.
Leontodon autumnalis L., I, R.
Liatris aspera Michx., N, R.
Liatris punctata Hook., N, R.
Liatris pycnostachya Michx., N, O; 2.
Liatris squarrosa (L.) Michx. var. *hirsuta* (Rydb.) Gaiser, N, R; 2, 3.
Matricaria matricarioides (Less.) Porter, I, C; 3.
Prenanthes aspera Michx., N, R.
Pyrrhopappus carolinianus (Walt.) DC., I, R.
Ratibida columnifera (Nutt.) Woot. & Standl., N, O; 3.
Ratibida pinnata (Vent.) Barnh., N, U; 2, 3.
Rudbeckia hirta L., N, U.
Rudbeckia laciniata L., N, C.
Rudbeckia triloba L., N, U.
Senecio plattensis Nutt., N, U.
Senecio vulgaris L., I, R.
Silphium integrifolium Michx. var. *integrifolium*, N, C; 2, 3.
Silphium integrifolium Michx. var. *laeve* T. & G., N, U.
Silphium laciniatum L., N, O; 3.
Silphium perfoliatum L., N, C; 2, 3.
Solidago canadensis L., N, C; 3.
Solidago gigantea Ait., N, C; 3.
Solidago missouriensis Nutt., N, R; 2.
Solidago nemoralis Ait., N, R.
Solidago rigida L. var. *rigida*, N, O; 4.
Solidago speciosa Nutt., N, R.
Solidago ulmifolia Muhl., N, U.
Sonchus arvensis L. subsp. *uliginosus* (Bieb.) Nyman, I, R.
Sonchus asper (L.) Hill, I, C; 3.
Sonchus oleraceus L., I, U.
Taraxacum officinale Weber, I, C; 1, 3.
Tragopogon dubius Scop., I, C; 4.
Verbesina alternifolia (L.) Britt., N, C; 2, 3.
Vernonia arkansana DC., I, R.
Vernonia baldwinii Torr. subsp. *interior* (Small) Faust, N, C; 3.
Vernonia fasciculata Michx., N, U; 3.
Xanthium strumarium L., N, C; 3.
Balsaminaceae
Impatiens capensis Meerb., N, U.
Impatiens pallida Nutt., N, C; 3.
Berberidaceae
Berberis thunbergii DC., I, R.
Podophyllum peltatum L., N, O; 1.
Betulaceae
Corylus americana Walt., N, U; 3.
Ostrya virginiana (P. Mill.) K. Koch., N, U; 3.
Ignoniaceae
Campsis radicans (L.) Seem., I, U.
Catalpa speciosa Warder, I, O.
Boraginaceae
Amsinckia intermedia Fisch. & Mey., I, R.
Cynoglossum officinale L., I, R. *
Hackelia virginiana (L.) I. M. Johnston, N, C; 2.
Lappula echinata Gilib., I, U.
Lithospermum arvense L., I, O.
Lithospermum canescens (Michx.) Lehm., N, O; 1.
Lithospermum latifolium Michx., N, O.
Mertensia virginica (L.) Pers., N, R; 1.
Onosmodium molle Michx. var. *occidentale* (Mack.) Johnston, N, R; 3.
Brassicaceae
Alliaria petiolata (Bieb.) Cavara & Grande, I, O.
Arabis canadensis L., N, U; 2.
Armoracia rusticana Gaertn. B. Mey. & Scherb., I, R; 1.
Barbarea vulgaris R. Br., I, C.
Berteroa incana (L.) DC., I, R.
Brassica juncea (L.) Czern., I, O; 3. **
Brassica kaber (DC.) Wheeler, I, C; 3.
Brassica nigra (L.) Koch, I, U; 2.
Capsella bursa-pastoris (L.) Medic., I, C; 1, 3.
Cardamine concatenata (Michx.) O. Schwartz, N, C.
Cardaria chalapensis (L.) Handel-Mazzetti, I, U.
Cardaria draba (L.) Desv., I, U; 3.
Discouraria pinnata (Walt.) Britt. ssp. *brachycarpa* (Richard.) Detling, N, C; 1.
Descurainia sophia (L.) Webb, I, C.
Erysimum asperum (Nutt.) DC., I, R.
Erysimum cheiranthoides L., I, O.
Erysimum inconspicuum (S. Wats.) MacM., N, O.
Erysimum repandum L., I, U.
Hesperis matronalis L., I, U.
Lepidium campestre (L.) Br., I, U; 3.
Lepidium densiflorum Schrad., N, C; 4.
Lepidium virginicum L., N, U; 3.
Rorippa austriaca (Crantz) Bess. I, O.
Rorippa palustris (L.) Bess. ssp. *glabra* (Schulz) Stuckey var. *fernaldiana* (Butt. & Abbe.) Stuckey, N, C; 3.
Rorippa sessiliflora (Nutt.) Hitchc., N, U; 2, 3.
Rorippa sinuata (Nutt.) Hitchc., N, R; 4.
Rorippa sylvestris (L.) Bess., I, U.
Sisymbrium altissimum Nutt., I, U; 3.
Sisymbrium loeselii L., I, U.
Sisymbrium officinale (L.) Scop. var. *leiocarpum* DC., I, C; 4.
Thlaspi arvense L., I, C; 3.
Cactaceae
Opuntia macrorhiza Engelm., N, R.
Caesalpinaceae
Cassia chamaecrista L., N, C; 2, 3.
Cassia marilandica L., N, U; 2.
Cercis canadensis L., N, R.
Gleditsia triacanthos L., N, C; 2.
Gymnocladus dioica (L.) K. Koch, N, O.
Campanulaceae
Campanula americana L., N, C; 2, 3.
Lobelia inflata L., N, O.
Lobelia siphilitica L., N, U; 2, 3.
Lobelia spicata Lam., N, U; 3.
Triodanis leptocarpa (Nutt.) Nieuw., N, R.
Triodanis perfoliata (L.) Nieuw., N, U; 3.
Cannabaceae
Cannabis sativa L., I, C; 2, 3.
Humulus japonicus Sieb. & Zucc., I, U; 3.
Humulus lupulus L. var. *pubescens* E. Small, N, U; 3.
Capparaceae
Polanisia dodecandra (L.) DC. subsp. *trachysperma* (T. & G.) Iltis, N, U.
Caprifoliaceae
Lonicera japonica Thunb., I, O.
Lonicera sempervirens Ait., I, O.
Lonicera tatarica L., I, U.
Sambucus canadensis L., N, C; 2, 3.
Symphoricarpos occidentalis Hook., N, O; 3.
Symphoricarpos orbiculatus Moench, N, C; 2, 3.
Triosteum perfoliatum L., N, U; 2.
Viburnum lentago L., N, O.
Caryophyllaceae
Cerastium nutans Raf., I, U.
Cerastium vulgatum L., I, U.
Dianthus armeria L., I, U.
Holosteum umbellatum L., I, R.
Paronychia canadensis (L.) Wood, N, O; 2, 3.
Saponaria officinalis L., I, C; 3.
Silene antirrhina L., N, U; 3.
Silene cseri Baumg., I, R.
Silene pratensis (Raf.) Godr. & Gren., I, U; 3.
Silene stellata (L.) Ait., N, U; 2.
Stellaria media (L.) Cyr., I, C; 3.
Celastraceae
Celastrus scandens L., N, C.
Euonymus atropurpureus Jacq., N, U; 3.
Ceratophyllaceae
Ceratophyllum demersum L., N, U.
Chenopodiaceae
Atriplex subspicata (Nutt.) Rydb., N, U.
Chenopodium album L., I, C; 4.
Chenopodium ambrosioides L., I, R.
Chenopodium berlandieri Moq., N, C.
Chenopodium gigantespermum Aellen, N, C.
Chenopodium standleyanum Aellen, N, U; 3.
Chenopodium strictum Roth, N, U.
Kochia scoparia (L.) Schrad., I, C.
Monolepis nuttalliana (R. & S.) Greene, N(?), O.
Salsola collina Pall., I, O.
Salsola iberica Senn. & Pau, I, U.
Cistaceae
Helianthemum bicknellii Fern., N, O.
Clusiaceae
Hypericum perforatum L., I, U.
Convulvulaceae
Calystegia macounii (Greene) Brummitt, N, R.
Calystegia sepium (L.) R. Br. ssp. *angulata* Brummitt, N, C; 2.
Convolvulus arvensis L., I, C; 3.
Ipomoea hederacea Jacq., I, C.
Ipomoea purpurea (L.) Roth, I, C; 3.
Cornaceae
Cornus amomum P. Mill., N, O.
Cornus drummondii C. A. Mey., N, C; 3.

- Cornus foemina* P. Mill. ssp. *racemosa* (Lam.) J. S. Wils., N, U.
- Crassulaceae**
Penthorum sedoides L., N, C; 3.
- Cucurbitaceae**
Echinocystis lobata (Michx.) T. & G., N, U; 2, 3.
Sicyos angulatus L., N, U.
- Cuscutaceae**
Cuscuta cephalanthi Engelm., N, R.
Cuscuta glomerata Choisy, N, U; 3.
Cuscuta gronovii Willd., N, O.
Cuscuta polygonorum Engelm., N, O.
- Dipsacaceae**
Dipsacus follonum L., I, O.
- Ebenaceae**
Diospyros virginiana L., I, R.
- Elaeagnaceae**
Elaeagnus angustifolia L., I, R. **
- Euphorbiaceae**
Acalypha rhomboidea Raf., N, U.
Acalypha virginica L., N, C; 2.
Croton capitatus Michx., N, O.
Croton glandulosus L. var. *septentrionalis* Muell. Arg., N, R.
Euphorbia corollata L., N, C; 2, 3.
Euphorbia cyparissias L., I, R.
Euphorbia dentata Michx., N, C; 3.
Euphorbia maculata L., N, C; 3.
Euphorbia marginata Pursh, I, O.
Euphorbia nutans Lag., N, C.
Euphorbia prostrata Ait., N, U.
- Fabaceae**
Amorpha canescens Pursh, N, U; 2.
Amorpha fruticosa L., N, O.
Amphicarpaea bracteata (L.) Fern., N, C; 2.
Apios americana Medic., N, O; 3.
Astragalus canadensis L., N, U; 2.
Baptisia australis (L.) R. Br. var. *minor* (Lehm.) S. Wats., N, R.
Baptisia bracteata Muhl. ex Ell. var. *glabrescens* (Larisey) Isely, N, O; 1.
Baptisia lactea (Raf.) Thieret, N, O.
Coronilla varia L., I, C.
Crotalaria sagittalis L., N, R.
Dalea candida Michx. ex Willd. var. *candida*, N, O; 2, 3.
Dalea purpurea Vent. var. *purpurea*, N, O.
Desmodium canadense (L.) DC., N, U; 4.
Desmodium canescens (L.) DC., N, U; 3.
Desmodium cuspidatum (Muhl. ex Willd.) Loud., N, O.
Desmodium glutinosum (Muhl. ex Willd.) Wood, N, C; 2.
Desmodium illinoense A. Gray, N, C; 2, 3.
Desmodium paniculatum (L.) DC., N, C.
Glycine max (L.) Merr., I, R.
Glycyrrhiza lepidota Pursh, N, R.
Lathyrus japonicus Willd., I, R.
Lathyrus latifolius L., I, U.
Lespedeza capitata Michx., N, C; 2.
Lespedeza cuneata (Dumont) G. Don, I, R.
Lespedeza stipulacea Maxim., I, U.
Lespedeza violacea (L.) Pers., N, O; 2.
Lotus corniculatus L., I, C.
Medicago lupulina L., I, C.
Medicago sativa L. var. *salcata* (L.) Arang., I, R.
Medicago sativa L. var. *sativa*, I, C.
Melilotus alba Medic., I, C; 3.
Melilotus officinalis (L.) Pall., I, C; 3.
Psoralea argophylla Pursh, N, R; 2.
Psoralea tenuiflora Pursh var. *floribunda* (Nutt.) Rydb., N, R.
Robinia pseudo-acacia L., I, U; 3.
Strophostyles helvola (L.) Ell., N, U.
Trifolium campestre Schreb., I, O.
Trifolium hybridum L., I, U; 3.
Trifolium pratense L., I, C; 1, 3.
Trifolium repens L., I, C; 1, 3.
Vicia villosa Roth. var. *villosa*, I, U.
- Fagaceae**
Quercus alba L., N, C.
- Quercus borealis* Michx. var. *maxima* (Marsh.) Ashe, N, U; 32.
Quercus macrocarpa Michx., N, C; 2, 3.
Quercus muhlenbergii Engelm., N, O.
Quercus prinoides Willd., N, R.
Quercus velutina Lam., N, U.
- Fumariaceae**
Corydalis micrantha (Engelm.) A. Gray, N, O.
Dicentra cucullaria L., N, C; 1.
- Gentianaceae**
Gentiana alba Muhl., N, R.
Gentiana andrewsii Griseb., N, R.
Gentiana puberulenta Pringle, N, R.
- Geraniaceae**
Geranium carolinianum L., N, C; 3.
- Grossulariaceae**
Ribes missouriense Nutt., N, C; 3.
- Hippocastanaceae**
Aesculus glabra Willd. var. *arguta* (Buckl.) Robins., N, R.
- Hydrophyllaceae**
Ellisia nyctelea L., N, C.
Hydrophyllum virginianum L., N, C.
- Juglandaceae**
Carya cordiformis (Wang.) K. Koch, N, U; 2, 3.
Carya ovata (P. Mill) K. Koch, N, C; 2, 3.
Juglans nigra L., N, C; 2.
- Lamiaceae**
Agastache nepetoides (L.) O. Ktze., N, U; 2, 3.
Agastache scrophulariaefolia (Willd.) O. Ktze., N, R.
Dracocephalum parviflorum Nutt., I, R.
Glecoma hederacea L., I, C; 1, 2.
Hedeoma hispidum Pursh, N, U.
Hedeoma pulegioides (L.) Pers., N, C; 2.
Lamium amplexicaule L., I, U; 3.
Leonurus cardiaca L., I, C.
Leonurus marrubiastrum L., I, U.
Lycopus americanus Muhl. ex Bart., N, C; 3.
Mentha arvensis L., N, U; 3.
Monarda fistulosa L., N, U; 2, 3.
Nepeta cataria L., I, C; 4.
Physostegia virginiana (L.) Benth., N, R.
Prunella vulgaris L. var. *lanceolata* (Bart.) Fern. N, U; 2, 3.
Pycnanthemum virginianum Dur. & Jackson ex Robins. & Fern., N, O; 3.
Salvia reflexa Hornem., N, U; 2, 3.
Scutellaria lateriflora L., N, O.
Scutellaria parvula Michx. var. *leonardii* (Epl.) Fern., N, O; 3.
Stachys palustris L. ssp. *pilosa* (Nutt.) Epling, N, C.
Stachys tenuifolia Willd., N, R.
Teucrium canadense L. var. *canadense*, N, C; 2.
- Linaceae**
Linum sulcatum Ridd., N, R. **
- Lythraceae**
Ammannia coccinea Rottb., N, U.
Ammannia robusta Heer & Regel., N, U.
Lythrum alatum Pursh var. *alatum*, N, C; 3.
Lythrum salicaria L., I, R.
- Malvaceae**
Abutilon theophrasti Medic., I, C; 2, 3.
Althaea rosea Cav., I, R.
Callirhoe alcaeoides (Michx.) A. Gray, N, U.
Callirhoe bushii Fern., I(?), R.
Callirhoe involucreta (T. & G.) A. Gray, I, U.
Hibiscus trionum L., I, C; 3.
Malva neglecta Wallr., I, C; 3.
Sida spinosa L., I, C; 2.
- Menispermaceae**
Menispermum canadense L., N, U; 2.
- Mimosaceae**
Desmanthus illinoensis (Michx.) MacM., N, O.
- Molluginaceae**
Mollugo verticillata L., I, C.
- Monotropaceae**
Monotropa uniflora L., N, R.
- Moraceae**
Maclura pomifera (Raf.) Schneid., I, C; 3.
Morus alba L., I, C; 3.
- Morus rubra* L., N, U.
- Nelumbonaceae**
Nelumbo lutea (Willd.) Pers., N, R.
- Nyctaginaceae**
Mirabilis albida (Walt.) Heimerl., N, U.
Mirabilis hirsuta (Pursh) MacM., N, R; 3.
Mirabilis nyctaginea (Michx.) MacM., N, C; 3.
- Oleaceae**
Fraxinus americana L., N, O.
Fraxinus pennsylvanica Marsh., N, C.
- Onagraceae**
Circaea luteiana L. ssp. *canadensis* (L.) Asch. & Mag., N, U; 3.
Epilobium ciliatum Raf., N, U.
Gaura longiflora Spach, N, U.
Oenothera biennis L., N, U.
Oenothera laciniata Hill, N, R.
Oenothera villosa Thunb., N, C.
- Oxalidaceae**
Oxalis dillenii Jacq., N, C; 3.
Oxalis stricta L., N, C; 1.
Oxalis violacea L., N, R; 1, 3. *
- Papaveraceae**
Papaver orientale L., I, R.
Papaver somniferum L., I, R.
Sanguinaria canadensis L., N, O.
- Phytolaccaceae**
Phytolacca americana L., N, U; 3.
- Plantaginaceae**
Plantago aristata Michx., N, U; 3.
Plantago lanceolata L., I, C.
Plantago patagonica Jacq., N, C.
Plantago rugelii Dcne., N, C; 4.
Plantago virginica L., N, U.
- Platanaceae**
Platanus occidentalis L., N, R; 4.
- Polemoniaceae**
Ipomopsis rubra (L.) Wherry, I, R.
Pblox divaricata L. ssp. *laphamii* (Wood) Wherry, N, C.
Pblox paniculata L., I, O.
Pblox pilosa L., N, U; 3.
- Polygonaceae**
Polygonum achoreum Blake, I(?), C.
Polygonum amphibium L. var. *emersum* Michx., N, C; 3.
Polygonum arenastrum Jord. ex Bor., I, C.
Polygonum bicorne Raf., N, U.
Polygonum convolvulus L., I, C; 3.
Polygonum cuspidatum Sieb. & Zucc., I, O.
Polygonum hydropiper L., N, C; 4.
Polygonum hydropiperoides Michx., N, U.
Polygonum lapathifolium L., N, C; 4.
Polygonum pensylvanicum L., N, C; 4.
Polygonum persicaria L., I, C; 4.
Polygonum punctatum Ell., N, C; 3.
Polygonum ramosissimum Michx., N, O.
Polygonum scandens L. var. *scandens*, N, U.
Polygonum virginianum L., N, O; 2.
Rumex acetosella L., I, U; 4.
Rumex altissimus Wood, N, C; 4.
Rumex crispus L., I, C; 4.
Rumex patientia L., I, U.
- Portulacaceae**
Claytonia virginica L., N, U.
Portulaca oleracea L., I, C; 3.
- Primulaceae**
Lysimachia ciliata L., N, U.
Lysimachia nummularia L., I, U.
- Ranunculaceae**
Anemone canadensis L., N, U; 3.
Anemone cylindrica A. Gray, N, U.
Anemone virginiana L., N, U; 4.
Aquilegia canadensis L., N, U; 1.
Clematis pitcheri T. & G., N, U; 3.
Clematis virginiana L., N, U; 2.
Delphinium ajacis L., I, R.
Delphinium tricornis Michx., N, U; 1.
Delphinium virecens Nutt., N, R.
Ranunculus abortivus L., N, C; 1.
Ranunculus hispidus Michx. var. *hispidus*, N, U; 3.
Ranunculus sceleratus L. var. *sceleratus*, N & I, U.

- Thalictrum dasycarpum* Fisch. & Ave.-Lall., N, U; 2.
- Rhamnaceae**
Ceanothus americanus L. var. *pitcheri* T. & G., N, R; 2.
Ceanothus herbaceus Raf. var. *pubescens* (T. & G.) Shinnets, N, O.
Rhamnus lanceolata Pursh var. *glabrata* Gl., N, O; 2, 3.
- Rosaceae**
Agrimonia gryposepala Wallr., N, O.
Agrimonia pubescens Wallr., N, C; 4.
Crataegus crus-galli L., N, O; 2.
Crataegus mollis (T. & G.) Scheele, N, U.
Fragaria virginiana Duchn., N, C; 3.
Geum aleppicum Jacq., N, R.
Geum canadense Jacq., N, C; 2, 3.
Geum vernum (Raf.) T. & G., N, R.
Potentilla arguta Pursh, N, O.
Potentilla norvegica L., N, U; 3.
Potentilla recta L., I, U; 3.
Potentilla simplex Michx., N, O.
Prunus americana Marsh., N, C.
Prunus mexicana S. Wats., N, O.
Prunus serotina Ehrh., N, C; 2.
Prunus virginiana L., N, U; 1, 3.
Pyrus ioensis (Wood) Carruth, N, U; 2.
Pyrus malus L., I, O; 2.
Rosa arkansana Porter, N, C; 2, 3.
Rosa blanda Ait., N, O.
Rosa carolina L., N, O.
Rosa multiflora Thunb., I, U; 3.
Rosa setigera Michx., N, O.
Rubus allegheniensis Porter, N, C.
Rubus flagellaris L., N, O.
Rubus idaeus L. ssp. *sachalinensis* (Levl.) Focke, I, O.
Rubus occidentalis L., N, C; 1.
- Rubiaceae**
Cephalanthus occidentalis L., N, O; 3.
Galium aparine L., N, C; 3.
Galium circaezans Michx., N, U.
Galium concinnum T. & G., N, U; 2, 3.
Galium obtusum Bigel., N, U; 3.
Galium triflorum Michx., N, O.
- Rutaceae**
Ptelea trifoliata L., I, R.
Zanthoxylum americanum P. Mill., N, U; 4.
- Salicaceae**
Populus alba L., I, O; 3.
Populus deltoides Marsh. ssp. *monilifera* (Ait.) Eckenw., N, C; 3.
Populus nigra L., I, O.
Salix amygdaloides Anderss., N, C; 2, 3.
Salix eriocephala Michx., N, U.
Salix exigua Nutt. var. *interior* (Rowlee) Cronq., N, C; 1, 2.
Salix nigra Marsh., N, C; 2, 3.
- Santalaceae**
Comandra umbellata (L.) Nutt., N, R; 2, 3.
- Scrophulariaceae**
Chaenorrhinum minus (L.) Lange, Wilk. & Lange, I, U.
Dasistoma macrophylla (Nutt.) Raf., N, C; 2.
Linaria vulgaris Hill, I, O; 2.
Lindernia dubia (L.) Penn., N, U.
Mimulus ringens L., N, U.
Pedicularis canadensis L., N, U.
Penstemon digitalis Nutt. ex Sims, N, O.
Scrophularia marilandica L., N, U.
Verbascum blattaria L., I, U.
Verbascum thapsus L., I, C; 2.
Veronica agrestis L., I, U.
Veronica arvensis L., I, C; 3.
Veronica peregrina L. var. *peregrina*, N, C; 4.
Veronicastrum virginicum (L.) Farw., N, O.
- Simaroubaceae**
Ailanthus altissima (P. Mill.) Swingle, I, O.
- Solanaceae**
Datura stramonium L., I, C; 2.
Lycium balimifolium P. Mill., I, U; 2.
Physalis heterophylla Nees, N, C; 3.
Physalis longifolia Nutt., N, C.
Physalis virginiana P. Mill., N, U; 3.
Solanum carolinense L., N, C; 3.
Solanum ptycanthum Dun. ex DC., N, C; 2.
Solanum rostratum Dun., I, U; 2.
- Tiliaceae**
Tilia americana L., N, U; 3.
- Ulmaceae**
Celtis occidentalis L., N, C; 2, 3.
Ulmus americana L., N, C; 1, 2, 3.
Ulmus pumila L., I, C. **
Ulmus rubra Muhl., N, C; 2.
- Urticaceae**
Laportea canadensis (L.) Wedd., N, C; 3.
Parietaria pennsylvanica Muhl., N, U; 2.
Pilea pumila (L.) A. Gray, N, U; 4.
Urtica dioica L. ssp. *gracilis* (Ait.) Seland., N, C.
- Verbenaceae**
Lippia lanceolata (Michx.) Greene, N, O; 3.
Phryma leptostachya L., N, U; 2.
Verbena bracteata Lag. & Rodr., N, U.
Verbena canadensis (L.) Britt., I, R.
Verbena hastata L., N, C; 2.
Verbena x illicita Moldenke, N, R; hybrid of *V. stricta* and *V. urticifolia*.
Verbena stricta Vent., N, C; 3.
Verbena urticifolia L., N, C.
- Violaceae**
Viola pedatifida G. Don, N, U; 1, 3.
Viola pratensis Greene, N, C.
Viola pubescens Ait., N, U.
Viola sororia Willd., N, C.
Viola tricolor L., I, R.
- Vitaceae**
Parthenocissus quinquefolia (L.) Planch., N, C; 2, 3.
Parthenocissus vitacea (Knerr) Hitchc., N, C.
Vitis cinerea Engelm., N, R; 2.
Vitis riparia Michx., N, C; 2, 3.
- Zygophyllaceae**
Tribulus terrestris L., I, U; 3.
- MONOCOTYLEDONS**
- Agavaceae**
Yucca smalliana Fern. I, U.
- Alismataceae**
Echinodorus rostratus (Nutt.) Engelm., N, U.
Sagittaria brevirostra Mack. & Bush, N, U; 3.
Sagittaria calycina Engelm. N, U.
Sagittaria latifolia Willd., N, U; 4.
- Araceae**
Arisaema dracontium (L.) Schott., N, R; 2.
Arisaema triphyllum (L.) Schott., N, U; 1, 3.
- Commelinaceae**
Commelina communis L., I, U; 3.
Tradescantia bracteata Small, N, U; 1, 3.
Tradescantia obiensis Raf., N, U.
- Cyperaceae**
Carex aggregata Mack. N, U.
Carex amphibola Steud. var. *turgida* Fern., N, C.
Carex annectens (Bickn.) Bickn. var. *xanthocarpa* (Bickn.) Wieg., N, O.
Carex ariticta Mack., N, U.
Carex bicknellii Britt., N, O; 3.
Carex blanda Dew, N, C.
Carex brevior (Dewey) Mack. ex Lunell, N, C; 3.
Carex bushii Mack., N, O.
Carex cephalophora Willd. var. *cephalophora*, N, C; 3.
Carex cristatella Britt., N, C; 3.
Carex davisii Schwein. & Torr., N, C; 3.
Carex emoryi Dew, N, U.
Carex festucacea Schkuhr., N, R.
Carex frankii Kunth., N, U.
Carex gravida Bailey var. *gravida*, N, C; 3.
Carex hystericina Muhl. ex Willd., N, U.
Carex jamesii Schwein., N, U.
Carex lacustris L., N, R.
Carex laeviconica Dewey, N, U.
Carex lanuginosa Michx., N, C; 3.
Carex leavenworthii Dew., N, O.
Carex lupulina Willd., N, R; 2.
Carex meadii Dew., N, U; 3.
Carex mesochorea Mack., N(?), R.
- Carex molesta* Mack., N, U; 3.
Carex muhlenbergii Willd. var. *australis* Olney, N, R; 3.
Carex normalis Mack., N, U.
Carex oligocarpa Willd., N, U.
Carex pennsylvanica Lam., N, O; 3.
Carex praegracilis W. Boott, N, R.
Carex rosea Willd., N, C.
Carex sartwellii Dewey, N, O.
Carex scoparia Schkuhr ex Willd., N, O.
Carex sparganioides Willd., N, C; 3.
Carex stipata Muhl., N, U; 3.
Carex tenera Dew., N, O.
Carex tribuloides Wahl., N, O; 3.
Carex trinervis (Spreng.) Marcks., N, R.
Cyperus odoratus L., N, C; 3.
Cyperus rivularis Kunth., N, R.
Cyperus strigosus L., N, C; 3.
Eleocharis compressa Sulliv., N, R; 3.
Eleocharis erythropoda Steud., N, C; 3.
Eleocharis obtusa (Willd.) J. A. Schult., N, U; 3.
Eleocharis xyridiformis Fern. & Brackett, I(?), R.
Scirpus acutus Muhl., N, U.
Scirpus atrovirens Willd., N, C; 3.
Scirpus cyperinus (L.) Kunth., N, R; 3.
Scirpus fluviatilis (Torr.) A. Gray, N, O; 4.
Scirpus mucronatus L., I, R.
Scirpus pallidus (Britt.) Fern., N, U.
Scirpus validus Vahl., N, U; 4.
Scleria triglomerata Michx., N, R.
- Dioscoreaceae**
Dioscorea villosa L., N, U.
- Iridaceae**
Iris pseudacorus L., I, U.
Iris virginica L. var. *shrevei* (Small) Anderson, N, O; 2, 3.
Sisyrinchium campestre Bickn., N, O; 3.
- Juncaceae**
Juncus dudleyi Wieg., N, U.
Juncus interior Wieg., N, R; 3.
Juncus tenuis Willd., N, C; 3.
Juncus torreyi Cov., N, U; 3.
- Lemnaceae**
Lemna minor L., N, C; 2.
Spirodela polyrrhiza (L.) Schleid., N, O; 3.
Wolffia borealis (Engelm.) Landolt, N, O.
Wolffia columbiana Karst., N, O.
- Liliaceae**
Allium canadense L. var. *canadense*, N, C; 3.
Allium fistulosum L., I, R.
Allium sativum L., I, R.
Allium tricoccum Soland., N, O.
Allium vineale L., I, R.
Asparagus officinalis L., I, U; 2.
Convallaria majalis L., I, O.
Erythronium albidum Nutt., N, C; 1.
Erythronium mesochoreum Knerr, N, O.
Hemerocallis fulva L., I, C; 3.
Hypoxis hirsuta (L.) Cov., N, R. *
Lilium canadense L., N, O.
Muscari botryoides (L.) P. Mill., I, O.
Ornithogalum umbellatum L., I, R.
Polygonatum biflorum (Walt.) Ell., N, C; 2, 3.
Smilacina racemosa (L.) Desf., N, O.
Scilla sibirica Haw., I, R.
- Najadaceae**
Najas flexilis (Willd.) Rostk. & Schmidt., N.
Najas guadalupensis (Spreng.) Magnus, N, C.
- Orchidaceae**
Galearis spectabilis (L.) Raf., N, R.
- Poaceae**
Agropyron repens (L.) Beauv., I, C; 3.
Agropyron smithii Rydb., N, U.
Agrostis byemalis (Walt.) B.S.P., N, R.
Agrostis stolonifera L., N, C.
Alloplecurus carolinianus Walt., N, R; 3.
Andropogon gerardii Vitman, N, U; 3.
Andropogon scoparius Michx., N, U.
Aristida oligantha Michx., N, U; 3.

- Avena fatua* L. var. *sativa* (L.) Hausskn., I, O; 3.
Bouteloua curtipendula (Michx.) Torr., N, U; 2.
Bromus inermis Leyss. ssp. *inermis*, I, C; 3.
Bromus japonicus Thunb. ex Murr., I, C.
Bromus pubescens Muhl. ex Willd., N, U.
Bromus tectorum L., I, C; 3.
Bucblœ dactyloides (Nutt.) Engelm., I, R.
Calamagrostis canadensis (Michx.) Beauv., N, R.
Cenchrus longispinus (Hack.) Fern., N, U.
Chloris verticillata Nutt., N, U.
Dactylis glomerata L., I, C; 2.
Diarrhena americana Beauv. var. *obovata* Gl., N, R.
Dichanthelium acuminatum (Sw.) Gould & Clark var. *acuminatum*, N, O.
Dichanthelium acuminatum (Sw.) Gould & Clark var. *implicatum* (Scribn.) Gould & Clark, N, U.
Dichanthelium latifolium (L.) Gould., N, O.
Dichanthelium oligosanthes (Schult.) Gould var. *scribnerianum* (Nash) Gould, N, C; 3.
Digitaria ciliaris (Retz.) Koel., I, C.
Digitaria ischaemum (Schreb. ex Schweigg.) Schreb. ex Muhl., I, C.
Digitaria sanguinalis (L.) Scop., I, U; 4.
Echinochloa crusgalli (L.) Beauv., I, C; 3.
Echinochloa muricata (Beauv.) Fern. var. *microstachya* Wieg., N, C.
Echinochloa muricata (Beauv.) Fern. var. *muricata*, N, C.
Eleusine indica (L.) Gaertn., I, C.
 × *Elybordeum towense* Pohl, N, R; hybrid of *Hordeum jubatum* and *Elymus villosus* (Pohl, 1966).
Elymus canadensis L., N, C; 3.
Elymus villosus Muhl. ex Willd., N, C; 2.
Elymus virginicus L., N, C; 3.
Eragrostis cilianensis (All.) E. Mosher, I, C; 3.
Eragrostis frankii C. A. Mey. ex Steud., N, R.
Eragrostis hypnoides (Lam.) B.S.P., N, U.
Eragrostis minor Host, I, U; 2.
Eragrostis pectinacea (Michx.) Nees, N, C.
Eragrostis spectabilis (Pursh) Steud., N, U.
Eriochloa villosa (Thunb.) Kunth., I, O.
Festuca arundinacea Schreb., I, C.
Festuca obtusa Biehler, N, C.
Festuca ovina L. var. *rydbergii* St. Yves, I, U.
Festuca pratensis Huds., I, U.
Glyceria striata (Lam.) Hitchc., N, C; 3.
Hordeum jubatum L., N, C; 3.
Hordeum pusillum Nutt., N, C; 3.
Hordeum vulgare L., I, R.
Hystrix patula Moench, N, C; 2.
Koeleria pyramidata (Lam.) Beauv., N, R; 3.
Leersia oryzoides (L.) Sw., N, C.
Leersia virginica Willd., N, U; 3.
Leptochloa fascicularis (Lam.) A. Gray, N, U.
Leptoloma cognatum (Schult.) Chase, N, R.
Lolium perenne L. var. *aristatum* Willd., I, O.
Lolium perenne L. var. *perenne*, I, C; 3.
Miscanthus sacchariflorus (Maxim.) Hack., I, O.
Muhlenbergia bushii R. Pohl, N, R.
Muhlenbergia frondosa (Poir.) Fern., N, U; 3.
Muhlenbergia racemosa (Michx.) B.S.P., N, U.
Muhlenbergia schreberi J. F. Gmel., N, C; 3.
Muhlenbergia sobolifera (Muhl.) Trin., N, U.
Panicum capillare L., N, U; 3.
Panicum dichotomiflorum Michx., N, C.
Panicum miliaceum L., I, R.
Panicum virgatum L., N, C.
Paspalum setaceum Michx. var. *muhlenbergii* (Nash) D. Banks, I, R.
Paspalum setaceum Michx. var. *stramineum* (Nash) D. Banks, N, U.
Phalaris arundinacea L., N & I, C; 3.
Phleum pratense L., I, U; 2, 3.
Phragmites australis (Cav.) Trin. ex Steud., N, O.
Poa annua L., I, U.
Poa compressa L., I, C.
Poa palustris L., I, R.
Poa pratensis L., N & I, C; 3.
Poa sylvestris A. Gray, N, U.
Schedonnardus paniculatus (Nutt.) Trel., N, O.
Sclerochloa dura (L.) Beauv., I, R.
Setaria faberi Herrm., I, C; 3.
Setaria glauca (L.) Beauv., I, C; 2.
Setaria viridis (L.) Beauv., I, C; 2, 3.
Sorghastrum nutans (L.) Nash, N, U.
Sorghum bicolor (L.) Moench var. *bicolor*, I, R.
Sorghum bicolor (L.) Moench var. *drummondii* (Steud.) de Wer, I, U.
Sorghum halepense (L.) Pers., I, O.
Spartina pectinata Link, N, U; 2, 3.
Sphenopholis obtusata (Michx.) Scribn. var. *major* (Torr.) Erdm., N, U.
Sphenopholis obtusata (Michx.) Scribn. var. *obtusata*, N, O; 3.
Sporobolus asper (Michx.) Kunth var. *asper*, N, C; 3.
Sporobolus cryptandrus (Torr.) A. Gray, N, O.
Sporobolus heterolepis (A. Gray) A. Gray, N, R.
Sporobolus neglectus Nash, N, C; 3.
Sporobolus vaginiflorus (Torr. ex Gray) Wood, N, O.
Stipa spartea Trin., N, O; 3.
Tridens flavus (L.) Hitchc., N, C.
Tripsacum dactyloides (L.) L., N, U.
Triticum aestivum L., I, O.
Zea mays L., I, U; 3.
Potamogetonaceae
Potamogeton foliosus Raf., N, C.
Potamogeton nodosus Poir., N, C.
Potamogeton pectinatus L., N, U.
Potamogeton pusillus L. var. *pusillus*, N, U.
Smilacaceae
Smilax ecirrhata (Engelm.) S. Wats., N, U.
Smilax herbacea L., N, U.
Smilax hispida Muhl., N, C.
Sparganiaceae
Sparganium eurycarpum Engelm., N, O, 4.
Typhaceae
Typha angustifolia L., N, U.
Typha latifolia L., N, C; 2, 3. **
Zannichelliaceae
Zannichellia palustris L., N, C.

Note added in proof: Since this article went to press, *Aster praealtus* Poir. and *Cordamine bulbosa* B.S.P., both rare native plants, were identified from Page County.