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FLORISTIC RECORDS IN THE PLATTE AND LOUP RIVER BOTTOMLANDS OF PLATTE COUNTY, NEBRASKA

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and

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ABSTRACT

A recent inventory of vascular plants in the Loup and Platte riverbottoms in Platte County has greatly increased knowledge of the area's flora. Of the 542 species of vascular plants now known to grow in the county, 289 were discovered after 1977, with more than 100 of those after 1990. 425 native and 117 naturalized species are known so far. Nearly 700 native and naturalized alien species are expected to occur in the county, based upon totals from nearby counties. Thus, almost 150 years after European settlement, more than 20% of the species remain unverified; of those, many are undoubtedly nonnative. The riverbottoms of the county have the bestpreserved native flora and are today much richer in species than the uplands, which are more heavily impacted by agriculture.

† † †

Ecology and Background

The area of union of the Loup River system with the Platte River basin near Columbus, Nebraska, provides a collective view of the plants found in both river systems. A comprehensive floristic determination for this area could be valuable for evaluation of future land-use impacts in those large watersheds. Growing threats of climate changes could have significant effects on local plant communities. Establishing accurate lists of species is important for detecting signs of change in our local flora.

With ninety-nine percent of the original tall-grass, mixed-grass and wetland prairies plowed for agriculture or used for grazing, populations of many once-common native species are now drastically reduced. Agriculture and urbanization have significantly altered the landscape for many species. As

land-use disturbances continue at a rapid rate, bottomland floras are now more diverse, heterogeneous mixes of plants than in presettlement times. The absence of frequent prairie fires and the invasion of many exotics threaten remaining fragments of native prairie and original bottomland forests.

History of Plant Collecting in Nebraska and Platte County

Published reports of Nebraska's flora begin with explorers Lewis and Clark in 1803-6, Nuttall and Bradbury in 1808, James of the Long Expedition in 1820, the Fremont Expedition in the 1840s, and the Warren Expedition of 1857. Among the early attempts to list Nebraska's complete flora are two catalogues, those of Samuel Aughey (1876) and H. J. Webber (1890). Local studies in the state have produced numerous floristic lists for counties and other areas. A detailed list of such publications from 1804 through 1985 is presented by Kantak and Churchill (1986); others are cited by Kaul et al. The state's vegetation was mapped at 1:1,000,000 by Kaul and Rolfsmeier (1993), and some detail was shown for Platte County. Satellite imagery is depicted at 30-meter resolution by the Nebraska Gap-Analysis Project (1993).

The earliest plant collections in Platte County were by Edwin James of the Long Expedition to the Rocky Mountains in 1820, who traveled the Platte Valley across Nebraska and made many original documentations of Nebraska plant life (Goodman and Lawson 1995). The plants James documented in what is now Platte County are Lithospermum incisum, fringed puccoon; Cirsium sp., a thistle; Vicia americana, American purple vetch (not on our list); Rhus glabra, smooth sumac; Asclepias speciosa, showy milkweed; Toxicodendron radicans, poison ivy;

Apocynum cannabinum, hemp dogbane; Helianthus petiolaris, plains sunflower; Amorpha fruticosa, wildindigo; Gaura coccinea, scarlet gaura; Monarda pectinata, a mint not on our list; Potamogeton nodosus, floating-leaf pondweed; Rubus occidentalis, black raspberry; Sparganium eurycarpum, bur-reed; Callirhoe involucrata, purple poppy-mallow; Plantago patagonica, woolly plantain; and Anemone canadensis, meadow anemone.

The junction of the Loup and Platte rivers at Columbus was a landmark for Pawnee Indians in the 1820s (Ducey 2000). Warren (1875) noted that the valley of the Loup Fork was well wooded as far up as the Pawnee villages to the west of present-day Platte County. The Platte River at Columbus was described as having a sand bottom and many sandbars, and the floodplain was said to be from two to ten miles wide, as it is today. In 1844, Carleton reached the fork of the Loup and Platte Rivers and remarked:

The bed of the river is but one wide expanse of quicksand, which is formed in bars and these are continually changing and driving about. The channels are innumerable, but are usually only a foot or so deeper than the surrounding water. The river is filled with beautiful islands. They are all well wooded, but only here and there is there any timber growing upon the main banks. Sometimes we found the channels between the islands and the shore, entirely dry, presenting to the eye a wide extent of sand, which as the wind swept over it, was blown about in clouds, as one would notice on a barren coast of the ocean. The bottomlands are what would be called high river prairie (Carleton 1844-1846 (1983)).

Curry (1950) wrote that when the city of Columbus was founded, prior to 1870, the grass "blue joint" grew thick and matted, was taller than a man's head and common in the area. It was reported to grow between twelve and fifteen feet tall along the sloughs in the area and defied any attempts by

primitive plows. (The plant called blue-joint today is Calamagrostis canadensis, which never grows that tall, and perhaps Curry was describing Phragmites australis, common reed, which reaches such height in moist habitats. Calamagrostis canadensis is not on our list of vouchered species, but it is known from several adjacent counties and is undoubtedly in Platte County today.)

The Loup River drains much of the Sandhills, which are less disturbed than most areas of the state, but the substitution of cattle for bison has altered grazing patterns and affected native flora there. The Platte River originates in Colorado and has numerous diversions, with significant irrigation usage and storage along the entire watercourse. Row-crop agriculture dominates its borderlands.

METHODS

Our 12-year sampling period, 1996-2007. documents species within the Platte and Loup River bottoms after 150 years of settlement by Euro-Americans in these watersheds. For completeness and comparison, we list all species ever collected in Platte County, as documented by specimens deposited in various university herbaria, especially that of the University of Nebraska-Lincoln, which houses many specimens we collected. The list was assembled from Atlas of the Flora of the Great Plains (Great Plains Flora Association 1977), The Flora of Nebraska (Kaul et al. 2006), and our own observations and collecting. It consists almost entirely of plants collected in the bottomlands of Platte County, because very little collecting has been done in the much-disturbed, agricultural uplands north of bottomlands, most of whose species also occur in the bottomlands. This congregation of plants of river bottoms appears to be common in the lower reaches of the Platte River.

Apocynum cannabinum, hemp dogbane; Helianthus petiolaris, plains sunflower; Amorpha fruticosa, wildindigo; Gaura coccinea, scarlet gaura; Monarda pectinata, a mint not on our list; Potamogeton nodosus, floating-leaf pondweed; Rubus occidentalis, black raspberry; Sparganium eurycarpum, bur-reed; Callirhoe involucrata, purple poppy-mallow; Plantago patagonica, woolly plantain; and Anemone canadensis, meadow anemone.

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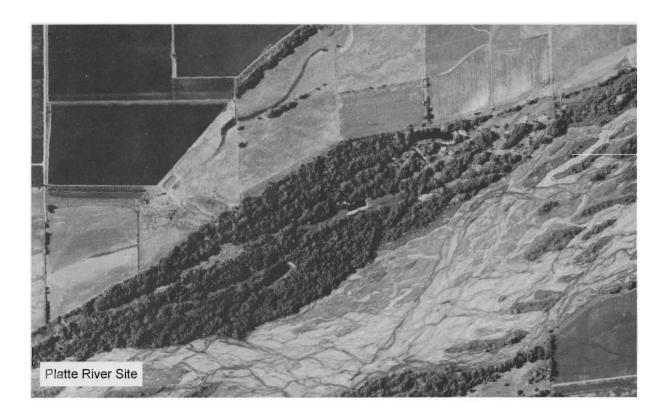
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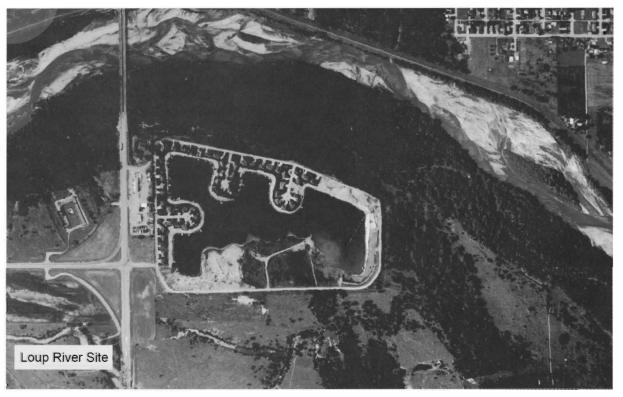


Figure 2. Aerial view of sites. Top: Witchey's Island Site, by the Platte River. North is at the top. The river was dry when the photograph was taken, and its braided bed is evident in the lower half of the picture. Bottom: Loup River Site. North is at the top, and Columbus is just out of range to the north. 1 inch = .17 mile

The focus for observations and collection were two primary sites on the Platte and Loup Rivers, where two of the largest watersheds in Nebraska unite (Fig. 1). The Platte River site is Witchey's Island (Fig. 2), a heavily wooded area (but not now a true island) on the north bank of the Platte River, equidistant between Duncan and Columbus on a parcel of property almost a mile in length. Witchey's Island has been grazed only minimally by livestock and natural deer populations, has not had fire for over 100

years, and has never been cultivated or farmed. It was homesteaded in 1864 by John Witchey, and according to historical record he maintained only a small garden and orchard. The Loup River site (Fig. 2) is on the south bank of the river and includes dense bottomland forest with open prairies, all on sandy soil

The coordinates for most plants collected are as follows:

Witchey's Island-Platte River Site (Fig. 2 Top)

NW corner of site
Latitude 41.3809542
Longitude -97.445221

NE corner of site
Latitude 41.3834823
Longitude -97.430938

SW corner of site
Latitude 41.37656772
Longitude -97.444935
SE corner of site
Latitude 41.3779800
Longitude -97.430747

Loup River Site (Fig. 2 Bottom)

NW corner of the site
Latitude 41.4162131
Longitude -97.367379

NE corner of site
Latitude 41.4139801
Longitude -97.354334

SW corner of the site SE corner of site Latitude 41.4079510 Latitude 41.4083231 Longitude -97.366522 Longitude -97.354334

Lake Babcock, three miles northwest of Columbus, was another sampling location, as was Buck Island on the Loup River southeast of the city. But most collecting was at the established Loup and Platte River study sites because of their ease of access

and the intact nature of their flora. The sampling locations were walked during the spring, summer and fall growing seasons, typically on a weekly basis, to identify species not previously vouchered.

Table 1. Species of native and naturalized trees, shrubs, woody vines, and herbs

	Trees	Shrubs	Lianas	Herbs	totals
Native	13	20	7	385	425
Introduced	8	10	1	98	117
totals	21	30	8	483	542

20

RESULTS AND DISCUSSION

The native and naturalized species known so far are summarized in Table 1 above, and the full list of those species follows the text, as Table 2.

The Witchey's Island site is representative of an eastern Nebraska riparian forest with a mixedhardwood community, where the tree canopy is *Celtis* occidentalis, hackberry; Fraxinus pennslyvanica, green ash; Morus alba, white mulberry; Quercus macrocarpa, bur oak; and Ulmus americana, American elm. Cottonwoods, Populus deltoides, are present, but not to the large size of those in the Loup River site. The representative shrubs for this community are Cornus drummondii, rough-leaf dogwood; Ribes missouriense, Missouri gooseberry; Symphoricarpos occidentalis and S. orbiculatus, wolfberry and coralberry; and Zanthoxylum americanum, prickly-ash. Abundant woody vines (lianas) form jungle-like tangles: Parthenocissus quinquefolia, Virginia creeper, and P. vitacea, woodbine; Smilax hispida, green briar; Toxicodendron radicans, poison ivy; Menispermum canadense, moonseed; and Vitis riparia, riverbank grape. The herbaceous plants in this community include Carex spp., sedges; Elymus canadensis, Canada wild rye; Ageratina altissima, white snakeroot; Muhlenbergia spp., mully grasses; Sanicula canadensis, Canada sanicle; and Viola sororia, sister violet. community occurs in the floodplains of rivers and streams in the eastern fourth of the state and extends only slightly westward into central Nebraska, along the Loup and Platte River systems. Western wild rose, Rosa woodsii, is more typical of central and western Nebraska, but it is abundant and robust here.

The Loup River site is also representative of eastern-Nebraska riparian woodland, where the tree canopy is represented by cottonwood, many of them 10-30 m in height. The subcanopy contains Acer negundo, boxelder; Gleditsia triacanthos, honey locust; Fraxinus pennslyvanica, green ash; Ulmus americana, American elm; and Morus alba, white mulberry — all common at this site. Shrubs include Cornus drummondii, Ribes missouriense, Sambucus canadensis(elderberry), and Symphoricarpos orbiculatus. Parthenocissusquinquefolia, Toxicodendron radicans and Vitis riparia are also common. Representative herbaceous plants include Ageratina altissima, white snakeroot; Galium aparine, bedstraw; Geum canadense, white avens; Poa pratensis, Kentucky bluegrass; Rudbeckia laciniata,

cutleaf coneflower; and *Viola sororia*, sister violet—all common to abundant.

Recent intrusions of exotic, invasive species are evident: Lythrum salicaria, purple loosestrife; Euphorbia esula, leafy spurge; and introduced genotypes of *Phragmites australis*, common reed. We witnessed their rapid proliferation, but Tamarix ramosissima (salt-cedar) is not yet known in the study area, although it is rampant to the west, along the Platte. Some species apparently are moving upriver, east to west, such as Robinia pseudoacacia, black locust; Catalpa speciosa, northern catalpa; and Lonicera tatarica, Tatarian honeysuckle. invasive exotics Amur honeysuckle (Lonicera maackii) and autumn-olive (Elaeagnus umbellata) were not present in or near our study sites, but their currently aggressive westward spread across Nebraska assures eventual arrival in Platte County.

The Loup River site has naturalized species such as Rhamnus cathartica, buckthorn; Convallaria majalis, lily-of-the-valley; and Lonicera tatarica, which are common there but not at the Witchey's Island site. The latter site harbors such natives as Hibiscus laevis, halberd-leaf rosemallow; Mimulus monkey roundleaf flower; glabratus,Quercusmacrocarpa, bur oak, and the introduced Lysimachia nummularia, moneywort — all rare or absent at the River site. Prickly-ash, Zanthoxylum and rough-leaf dogwood, americanum, Cornusdrummondii, both native to the area, are increasingly abundant in the understory at Witchey's Island, especially in heavily grazed places because livestock do not eat them. Black locust, Robinia pseudoacacia, and northern catalpa, Catalpa speciosa, both native to southeastern North America, are invading the forests near the confluence of the rivers. Siberian elm, Ulmus pumila, and white mulberry, Morus alba, both introduced to North America from Asia long ago, are established and abundant. A native invasive tree, red-cedar (Juniperus virginiana), is abundant in fields and even in deep forests, and here as almost everywhere across the state, it overwhelms native ecosystems.

Some species reach their western limits in or near these sites, e.g., Arisaema triphyllum (jack-in-the-pulpit), Zanthoxylum americanum (prickly-ash), Erythronium albidum (prairie fawnlily), Viola pubescens (smooth yellow violet), and Parthenocissus quinquefolia (Virginia creeper). Others reach their eastern limits in the same area, e.g., Opuntia fragilis, little prickly-pear.

Table 2. Platte County families and species of vascular plants documented. New records (boldface) are as compared to mapped records in Atlas of the Flora of the Great Plains (Great Plains Flora Assn. 1977). Some of these new records are mapped in The Flora of Nebraska (Kaul et al. 2006), whose nomenclature is used below. Introduced, naturalized species are indicated by an asterisk (*). Most of the vouchering specimens are in the Bessey Herbarium of the University of Nebraska State Museum, Lincoln.

ACERACEAE

Acer ginnala, Amur maple*
Acer negundo, boxelder
Acer saccharinum, silver maple, soft
maple

ADOXACEAE

Viburnum opulus, highbush-cranberry*

AGAVACEAE

Yucca glauca, yucca

ALISMATACEAE

Sagittaria cuneata, arrowhead, duckpotato Sagittaria latifolia, arrowhead

AMARANTHACEAE

Amaranthus albus, pale amaranth Amaranthus retroflexus, redroot pigweed Amaranthus tuberculatus, water-hemp Froelichia floridana, snake-cotton Froelichia gracilis, slender snake-cotton

ANACARDIACEAE

Rhus aromatica, fragrant sumac*
Rhus glabra, smooth sumac
Rhus typhina "Laciniata", staghorn
sumac*
Toxicodendron radicans negundo, poison

ivy

Toxicodendron radicans rydbergii, poison ivy

APIACEAE

Berula erecta, water-parsnip
Cicuta maculata, common water-hemlock
Conium maculatum, poison-hemlock*
Osmorhiza longistylis, long-styled sweet
cicely

Polytaenia nuttallii, prairie-parsley Sanicula canadensis, Canada sanicle Sanicula odorata, cluster sanicle Spermolepis inermis, scaleseed

APOCYNACEAE

Apocynum cannabinum, hemp dogbane Asclepias arenaria, sand milkweed

Asclepias engelmanniana, slender-leaf milkweed

Asclepias incarnata, swamp milkweed Asclepias speciosa, showy milkweed Asclepias speciosa x syriaca, hybrid milkweed Asclepias syriaca, common milkweed

Asclepias verticillata, whorled milkweed Asclepias viridiflora, green milkweed

ARACEAE

Arisamea triphyllum, jack-in-the-pulpit

ASTERACEAE

aster

Achillea millefolium, yarrow Ageratina altissima, white snakeroot Ambrosia artemisiifolia, common ragweed

Ambrosia psilostachya, western ragweed Ambrosia trifida, giant ragweed Antennaria neglecta, pussytoes Antennaria parvifolia, pussytoes Arctium minus, burdock*
Artemisia dracunculus, silky wormwood Artemisia ludoviciana, Louisiana sage Aster novae-angliae, New England aster Aster oblongifolius, aromatic aster Aster praealtus nebraskensis, willowleaf

Bidens bipinnatus, Spanish needles Bidens cernuus, bur-marigold Bidens comosus, beggarticks Bidens connatus (both varieties), beggarticks

Bidens frondosus, beggarticks

Bidens trichosperma, tickseed sunflower Bidens vulgatus, beggarticks Brickellia eupatorioides corymbulosa, false

boneset Carduus nutans, musk thistle*

Cirsium altissimum, tall thistle

 $Cirsium\ canescens,\ Platte\ thistle$

Conyza canadensis, horseweed, marestail

Coreopsis lanceolata, lanceleaf tickseed*

Coreopsis tinctoria, plains coreopsis Dyssodia papposa, fetid marigold

Echinacea angustifolia, narrow-leaf purple coneflower

Eclipta prostrata, yerba de tajo
Erechtites hieraciifolia, fireweed
Erigeron annuus, annual fleabane
Erigeron philadelphicus, marsh fleabane
Erigeron strigosus, daisy fleabane
Eupatorium altissimum, tall boneset
Eupatorium maculatum v. bruneri,
spotted Joe Pye weed

Eupatorium perfoliatum, boneset Euthamia gymnospermoides, goldentop Gnaphalium obtusifolium, fragrant cudweed

Grindelia squarrosa, curly-cup gumweed Helenium autumnale, sneezeweed Helianthus annuus, common sunflower Helianthus grosseserratus, sawtooth sunflower

Helianthus petiolaris, plains sunflower Helianthus tuberosus, Jerusalem artichoke Heliopsis helianthoides, false sunflower Heterotheca latifolia, camphor-weed Heterotheca villosa, golden-aster Hymenopappus tenuifolius Iva annua, marsh-elder Lactuca serriola, prickly lettuce* Leucanthemum vulgare, oxeye daisy* Liatris punctata, gayfeather Liatris squarrosa glabrata, gayfeather Matricaria matricarioides, pineapple weed* Nothocalais cuspidata, false dandelion Ratibida columnifera, prairie coneflower Ratibida pinnata, grayhead coneflower Rudbeckia hirta, black-eyed Susan Rudbeckia laciniata, cutleaf coneflower Senecio plattensis, prairie ragwort Silphium integrifolium v. laeve, rosinweed

Silphium laciniatum, compass plant
Silphium perfoliatum, cup plant
Solidago canadensis, Canada goldenrod
Solidago gigantea, tall goldenrod
Solidago mollis, soft goldenrod
Solidago nemoralis, gray goldenrod
Taraxacum officinale, dandelion*
Thelesperma megapotamicum, greenthread
Tragopogon dubius, goat's-beard*
Vernonia baldwinii, interior, western
ironweed

Xanthium strumarium, spiny cocklebur

BALSAMINACEAE

Impatiens capensis, touch-me-not

BERBERIDACEAE

Berberis vulgaris, European barberry*

BIGNONIACEAE

Catalpa speciosa, northern catalpa*

BORAGINACEAE

Hackelia virginiana, stickseed
Lithospermum caroliniense, plains puccoon
Lithospermum incisum, fringed puccoon
Onosmodium molle occidentale, false
gromwell

BRASSICACEAE

Arabis hirsuta pycnocarpa, rock cress
Barbarea vulgaris, winter cress*
Capsella bursa-pastoris, shepherd's-purse*
Cardamine pensylvanica, bitter cress
Chorispora tenella, blue mustard*
Descurainia pinnata, tansy mustard
Descurainia sophia, tansy mustard*
Erysimum repandum, bushy wallflower*
Hesperis matronalis, dame's rocket*
Lepidium densiflorum, pepper-grass
Physaria ludoviciana, bladderpod
Rorippa palustris glabra, bog yellow-cress
Rorippa sessiliflora, yellow-cress
Sisymbrium loeselii, tall hedge-mustard*
Thlaspi arvense, field penny-cress*

CACTACEAE

Opuntia fragilis, little prickly-pear Opuntia humifusa, eastern prickly-pear

CAESALPINIACEAE

Chamaecrista fasciculata, showy partidgepea

Gleditsia triacanthos, honey-locust Gymnocladus dioica, Kentucky coffee tree

CAMPANULACEAE

Lobelia siphilitica, great blue lobelia Lobelia spicata, palespike lobelia Triodanis perfoliata, Venus's looking-glass

CANNABACEAE

Cannabis sativa, marijuana* Humulus lupulus, hop

CAPRIFOLIACEAE

Lonicera japonica, Japanese honeysuckle*

Lonicera morrowii, Morrow's

honeysuckle*

Lonicera tatarica, Tatarian honeysuckle*
Sambucus canadensis, elderberry
Symphoricarpos occidentalis, wolfberry
Symphoricarpos orbiculatus, coralberry

CARYOPHYLLACEAE

Agrostemma githago, corn-cockle*

Arenaria serpyllifolia, thyme-leaf sandwort*

Cerastium brachypodum, chickweed Cerastium fontanum vulgare, chickweed*

Dianthus armeria, Deptford pink*
Holosteum umbellatum, jagged
chickweed*

Saponaria officinalis, soapweed, bouncing Bet*

Stellaria media, common chickweed*

CELASTRACEAE

Celastrus scandens, American bittersweet

Euonymus atropurpureus, wahoo

CELTIDACEAE

Celtis occidentalis, hackberry

CERATOPHYLLACEAE

Ceratophyllum demersum, coontail

CHENOPODIACEAE

Chenopodium glaucum, oakleaf goosefoot*

Chenopodium simplex, maple-leaf goosefoot

Chenopodium standleyanum, Standley's goosefoot

Chenopodium strictum, goosefoot

Corispermum americanum, American bugseed

Cycloloma atriplicifolium, winged pigweed Kochia scoparia kochia, summer cypress* Salsola tragus = S. iberica, Russian thistle*

CISTACEAE

Lechea mucronata, pinweed

CLEOMACEAE

Polanisia jamesii, James's clammyweed

CLUSIACEAE

Hypericum perforatum, common St.John's-wort*

COMMELINACEAE

Commelina communis, dayflower*
Tradescantia occidentalis, spiderwort

CONVOVLVULACEAE

Calystegia macounii, Macoun's bindweed

Calystegia sepium angulata, hedge bindweed

Convolvulus arvensis, field bindweed*

Ipomoea hederacea, ivyleaf morningglory*

Ipomoea purpurea, common morningglory*

CORNACEAE

Cornus drummondii, rough-leaf dogwood Cornus sericea, red-osier dogwood

CRASSULACEAE

Penthorum sedoides, ditch stonecrop

CUCURBITACEAE

Echinocystis lobata, wild-cucumber Sicyos angulatus, bur-cucumber

CUPRESSACEAE

Juniperus virginiana, eastern red-cedar

CYPERACEAE

Bolboschoenus fluviatilis, river bulrush

Carex bebbii, sedge

Carex blanda, sedge

Carex brevior, sedge

Carex comosa, sedge

Carex crawei, sedge Carex davisii, sedge

Carex eleocharis, sedge

Carex emoryi, sedge

Carex granularis haleana, sedge

Carex gravida, sedge

Carex heliophila, sunsedge

Carex hystericina, sedge

Carex laeviconica, sedge

Carex meadii, sedge

Carex molesta, sedge

Carex pellita, sedge

Carex praegracilis, sedge

Carex sartwellii, sedge

Carex scoparia, sedge

Carex stipata, sedge

Carex tetanica, sedge
Carex vulpinoidea, sedge
Cyperus acuminatus, flatsedge
Cyperus bipartitus, brook flatsedge
Cyperus erythrorhizos, redroot flatsedge
Cyperus lupulinus lupulinus, flatsedge
Cyperus lupulinus x schweinitzii,
flatsedge

Cyperus odoratus, rusty flatsedge Cyperus schweinitzii, Schweinitz's flatsedge

Cyperus squarrosus, flatsedge Cyperus strigosus, false nutsedge, umbrella

Eleocharis compressa, spikerush Eleocharis erythropoda, redstem spikerush Schoenoplectus pungens, common threesquare

Schoenoplectus tabernaemontani, softstem bulrush Scirpus pallidus, bulrush Scirpus pendulus, bulrush

DRYOPTERIDACEAE
Onoclea sensibilis, sensitive fern

ELAEAGNACEAE
Elaeagnus angustifolia, Russian olive*

EQUISETACEAE

Equisetum arvense, field horsetail
Equisetum hyemale v. affine, scouring-rush
Equisetum laevigatum, scouring-rush

EUPHORBIACEAE

Acalypha rhomboidea, three-seeded mercury

Croton texensis, Texas croton
Euphorbia davidii, western toothed spurge
Euphorbia esula esula, leafy spurge*
Euphorbia geyeri, Geyer's spurge
Euphorbia glyptosperma, spurge
Euphorbia hexagona, six-angle spurge
Euphorbia marginata, snow-on-themountain

Euphorbia missurica intermedia, Missouri spurge Euphorbia nutans, eyebane

Euphorbia stictospora, spurge

FABACEAE

Amorpha canescens, leadplant Amorpha fruticosa, wild-indigo Apios americana, ground-nut Astragalus canadensis, Canadian milkvetch

Astragalus crassicarpus, ground-plum Crotalaria sagittalis, rattlebox Dalea leporina, hare's-foot dalea Dalea purpurea purpurea, purple prairieclover

Dalea villosa, silky prairie-clover

Desmodium glutinosum, large-flowered tick-clover

Glycyrrhiza lepidota, wild licorice Lathyrus polymorphus, hoary vetch Lespedeza capitata, round-head lespedeza

Lotus corniculatus, bird's-foot trefoil*
Lotus purshianus, prairie trefoil
Medicago lupulina, black medick*
Medicago sativa sativa, alfalfa*
Melilotus albus, white sweet-clover*
Melilotus officinalis, yellow sweet-clover*
Oxytropis lambertii, purple locoweed
Pediomelum argophyllum, silver-leaf
scurfpea

Pediomelum digitatum, palmleaf scurfpea Psoralidium lanceolatum, lemon scurfpea Robinia pseudoacacia, black-locust* Strophostyles helvula, wild bean Strophostyles leiosperma, slickseed wild bean

Trifolium hybridum, Alsike clover*
Trifolium pratense, red clover*
Trifolium repens, white clover*
Vicia villosa, hairy vetch*

FAGACEAE

Quercus macrocarpa, bur oak

GENTIANACEAE

Gentiana andrewsii dakotica, bottle gentian Gentiana puberulenta, downy gentian

GROSSULARIACEAE
Ribes missouriense, Missouri gooseberry

HYDROCHARITACEAE

Elodea nuttallii, elodea Naias guadalupensis, naiad

HYDROPHYLLACEAE

Ellisia nyctelea, waterpod

IRIDACEAE

Belamcanda chinensis, blackberry lily*

Iris germanica, bearded iris*
Iris pseudacorus, yellow iris, yellow flag*
Sisyrinchium campestre, blue-eyed grass
Sisyrinchium montanum, blue-eyed
grass

JUGLANDACEAE Juglans nigra, black walnut

JUNCACEAE

Juncus arcticus balticus, Baltic rush Juncus brachyphyllus, shortleaf rush Juncus dudleyi, Dudley's rush Juncus interior, inland rush Juncus torreyi, Torrey's rush

LAMIACEAE

Hedeoma hispida, rough false pennyroyal Leonurus cardiaca, motherwort* Lycopus americanus, American waterhorehound

Lycopus asper, western water-horehound Mentha arvensis, field mint Monarda fistulosa, wild-bergamot Monarda punctata occidentalis,

horsemint*

Nepeta cataria, catnip*

Prunella vulgaris lanceolata, American heal-all

Prunella vulgaris vulgaris, European heal-all

Pycnanthemum virginianum, Virginia mountain-mint

Salvia reflexa, Rocky Mountain salvia Scutellaria galericulata, marsh skullcap Scutellaria lateriflora, mad-dog skullcap Scutellaria parvula missouriensis, little skullcap

Teucrium canadense canadense, American germander

Teucrium canadense occidentale, American germander

LEMNACEAE

Lemna spp., duckweed
Spirodela polyrrhiza, greater duckweed
Wolffia columbiana, Columbian
watermeal

LILIACEAE

Allium canadense canadense, wild onion Allium canadense fraseri, wild onion Allium canadense lavendulare, wild onion Allium perdulce, fragrant onion

Asparagus officinalis, asparagus*
Convallaria majalis, lily-of-the-valley*
Erythronium albidum, prairie fawnlily
Hemerocallis fulva, daylily*
Hypoxis hirsuta, yellow star-grass
Polygonatum biflorum, Solomon's seal
Smilacina stellata, starry false Solomon's seal

LINACEAE

Linum rigidum simulans, stiff flax Linum sulcatum, grooved flax

LYTHRACEAE

Ammannia robusta, toothcup Lythrum alatum, winged loosestrife Lythrum salicaria, purple loosestrife*

MALVACEAE

Abutilon theophrasti, velvet leaf*

Callirhoe alcaeoides, pink poppy-mallow
Callirhoe involucrata, purple poppy-mallow

Hibiscus laevis, halberd-leaf rose-mallow

MARSILEACEAE

Marsilea vestita, pepperwort, water-clover

MENISPERMACEAE

Menispermum canadense, moonseed

MIMOSACEAE

Desmanthus illinoensis, Illinois tick-clover

MOLLUGINACEAE

Mollugo verticillata, carpet-weed

MORACEAE

Morus alba, white mulberry*

NELUMBONACEAE

Nelumbo lutea, American lotus, chinkapin

NYCTAGINACEAE

Mirabilis hirsuta, hairy four-o'clock Mirabilis nyctaginea, wild four-o'clock

NYMPHAEACEAE

Nymphaea odorata s.l., white waterlily

OLEACEAE

Fraxinus pennsylvanica, green ash

ONAGRACEAE

Calylophus serrulatus, plains eveningprimrose

Gaura coccinea, scarlet gaura
Oenothera biennis, common eveningprimrose

Oenothera rhombipetala, fourpoint evening-primrose

ORCHIDACEAE

Cypripedium candidum, white lady's-slipper

OXALIDACEAE

Oxalis dillenii, gray oxalis

PAPAVERACEAE

Argemone polyanthemos, prickly poppy

PHRYMACEAE

Phryma leptostachya, lopseed

PLANTAGINACEAE

Plantago lanceolata, English plantain* Plantago patagonica patagonica, woolly plantain

Plantago rugelii, American plantain Plantago virginica, plantain

POACEAE

Agropyron cristatum, crested wheatgrass*
Agrostis hyemalis, tickle-grass
Agrostis stolonifera, redtop*
Andropogon gerardii gerardii, big bluestem
Andropogon gerardii hallii, sand bluestem
Aristida basiramea, forktip three-awn
Aristida oligantha, oldfield three-awn
Bouteloua curtipendula, sideoats grama
Bouteloua gracilis, blue grama
Bouteloua hirsuta, hairy grama
Bromus inermis, smooth brome*
Bromus japonicus, hairy chess, Japanese
brome*

Bromus pubescens, Canada brome
Bromus tectorum, cheatgrass*
Buchloe dactyloides, buffalo grass
Calamovilfa longifolia, prairie sandreed
Cenchrus longispinus, sandbur
Chloris verticillata, windmill grass
Dactylis glomerata, orchard grass*
Digitaria cognata, fall witchgrass
Digitaria ischaemum, smooth crabgrass*
Digitaria sanguinalis, hairy crabrass*
Echinochloa crusgalli, barnyard grass*

Echinochloa muricata microstachya,

barnyard grass

Eleusine indica, goosegrass*
Elymus canadensis, Canada wild rye
Elymus elongatus, tall wheatgrass*
Elymus hispidus, intermdiate wheatgrass
Elymus repens, quackgrass*
Elymus smithii, western wheatgrass
Elymus trachycaulus trachycaulus,
slendeer wheatgrass
Elymus villosus, hairy wild-rye
Elymus virginicus, Virginia wild-rye

Eragrostis cilianensis, stinkgrass*
Eragrostis pectinacea, Carolina

lovegrass

Eragrostis spectabilis, purple lovegrass
Eragrostis trichodes, sand lovegrass
Eriochloa contracta, prairie cupgrass
Glyceria grandis, tall manna-grass
Glyceria striata, fowl manna-grass
Hordeum jubatum, foxtail barley
Hordeum pusillum, little barley
Koeleria macrantha, Junegrass
Leersia virginica, Virginian cutgrass
Lolium arundinaceum, tall-fescue
Lolium perenne, perennial ryegrass*
Miscanthus saccharifolius, silver grass,
miscanthus*

Muhlenbergia frondosa, wirestem muhly Muhlenbergia glomerata, muhly Muhlenbergia mexicana, wirestem muhly

Muhlenbergia pungens, blowout
Muhlenbergia racemosa, marsh muhly
Panicum acuminatum, panic grass
Panicum capillare, common witchgrass
Panicum dichotomiflorum, fall panicum
Panicum leibergii, Leiberg panicum
Panicum oligosanthes scribnerianum,
Scribner's panicum

Panicum virgatum, switchgrass Paspalum setaceum stramineum, paspalum Phalaris arundinacea, reed canary-grass* Phleum pratense, timothy*

Phragmites australis, common reed Poa annua, annual bluegrass* Poa compressa, Canada bluegrass Poa pratensis, Kentucky bluegrass (*?) Polypogon monspeliensis, rabbitfoot grass*

Redfieldia flexuosa, blowout grass Schedonnardus paniculatus, tumblegrass Schizachyrium scoparium, little bluestem Secale cereale, rye* Setaria italica, foxtail millet*
Setaria pumila, yellow foxtail*
Setaria verticillata, bristly foxtail*
Setaria viridis, green foxtail*
Sorghastrum nutans, switchgrass
Sorghum bicolor, sorghum, milo*
Spartina pectinata, prairie cordgrass
Sphenopholis obtusata major, wedgegrass
Sphenopholis obtusata obtusata,
wedgegrass

Sporobolus cryptandrus, sand dropseed Sporobolus vaginiflorus, poverty grass Stipa spartea, porcupine grass

Tridens flavus, purpletop grass Triplasis purpurea, purple sandgrass Tripsacum dactyloides, eastern

gamagrass Triticum aestivum, wheat*

Vulpia octoflora, six-weeks fescue
Zizania palustris interior, interior wildrice

POLEMONIACEAE

Phlox paniculata, summer phlox*

POLYGONACEAE

Eriogonum annuum, annual wildbuckwheat

Polygonum achoreum, knotweed

Polygonum aviculare, knotweed, wireweed*

Polygonum bicorne, pink smartweed

Polygonum coccineum, scarlet

smartweed

Polygonum convolvulus, black-bindweed*
Polygonum lapathifolium, nodding
smartweed

Polygonum pensylvanicum, Pennsylvania smartweed

Polygonum persicaria, smartweed* Polygonum punctatum, water

smartweed

Polygonum ramosissimum (all vars.), bushy knotweed

Polygonum scandens, climbing falsebuckwheat

Polygonum tenue, slender knotweed
Rumex acetosella, sheep sorrel*
Rumex altissimus, pale dock, tall dock
Rumex patientia orientalis, patience
dock*

Rumex stenophyllus, narrowleaf dock*

PONTEDERIACEAE

Heteranthera limosa, mud-plantain

PORTULACEAE

Phemeranthus parviflorus, prairie fame-flower

Phemeranthus rugospermus, sand fameflower

POTAMOGETONACEAE

Potamogeton foliosus, leafy pondweed Potamogeton illinoensis, Illinois pondweed

Potamogeton nodosus, floating-leaf pondweed

Potamogeton pectinatus, sago pondweed Potamogeton pusillus, small pondweed

PRIMULACEAE

Androsace occidentalis, western rockjasmine

Lysimachia nummularia, moneywort*

RANUNCULACEAE

Anemone canadensis, meadow anemone Anemone caroliniana, Carolina anemone Aquilegia canadensis, columbine Delphinium virescens, prairie larkspur Ranunculus abortivus, kidney-leaf buttercup

Ranunculus flabellaris, yellow watercrowfoot

Ranunculus longirostris, white watercrowfoot

Ranunculus sceleratus, cursed crowfoot Thalictrum dasycarpum, purple meadow-rue

RHAMNACEAE

Rhamnus cathartica, buckthorn*

ROSACEAE

Agrimonia gryposepala, agrimony
Geum canadense, white avens
Potentilla recta, sulfur cinquefoil
Prunus americana, American plum
Prunus pumila besseyi, sand cherry
Prunus tomentosa, Nanking cherry, bush
cherry*

Prunus virginiana, chokecherry Rosa arkansana, dwarf prairie-rose Rosa multiflora, multiflora rose* Rosa woodsii, western wild rose Rubus occidentalis, black raspberry

RUBIACEAE

Galium aparine, cleavers
Galium circaezans, woods bedstraw
Galium obtusum, bluntleaf bedstraw

RUTACEAE

Zanthoxylum americanum, prickly -ash

SALICACEAE

Populus alba, silver poplar*
Populus deltoides occidentalis, Plains
cottonwood

Salix amygdaloides, peach-leaf willow Salix eriocephala famelica, diamond willow

Salix exigua interior, sandbar willow

SANTALACEAE

Comandra umbellata umbellata, comandra, bastard toadflax

SCROPHULARIACEAE

Agalinis tenuifolia parvifolia, gerardia Bacopa rotundifolia, water-hyssop Gratiola neglecta, hedge-hyssop Leucospora multifida, leucospora Lindernia dubia, false pimpernel Mimulus glabratus, roundleaf monkeyflower

Mimulus ringens, Allegheny monkeyflower

Penstemon albidus, white beardtongue Penstemon angustifolius angustifolius, narrowleaf beardtongue

Penstemon buckleyi, Buckley's penstemon

Penstemon grandiflorus, large beardtongue **Scrophularia marilandica**, eastern figwort

Verbascum blattaria, moth mullein* Verbascum thapsus, common mullein* Veronica anagallis-aquatica, water speedwell*

Veronica catenata, water speedwell*
Veronica peregrina peregrina, purslane speedwell*

Veronica peregrina xalapensis, purslane speedwell*

Veronica polita, veronica*

SIMAROUBACEAE

Ailanthus altissima, tree-of-heaven*

SMILACACEAE

Smilax hispida, greenbriar, prickly catbriar

SOLANACEAE

Datura wrightii, angel's trumpet*
Physalis heterophylla, ivyleaf groundcherry

Physalis longifolia, common ground-cherry Solanum carolinense, horse-nettle Solanum interius, Plains black nightshade Solanum ptycanthum, black nightshade Solanum rostratum, buffalo bur

SPARGANIACEAE

Sparganium eurycarpum, bur-reed

TYPHACEAE

Typha angustifolia, narrowleaf cattail Typha latifolia, broadleaf cattail

ULMACEAE

Ulmus americana, American elm Ulmus pumila, Siberian elm* Ulmus rubra, red elm, slippery elm

URTICACEAE

Boehmeria cylindrica, false nettle Parietaria pensylvanica, pellitory Urtica dioica, stinging nettle

VERBENACEAE

Lippia lanceolata, northern fogfruit Verbena bracteata, prostrate vervain Verbena hastata, common vervain Verbena stricta, hoary vervain Verbena urticifolia, white vervain

VIOLACEAE

Viola pubescens eriocarpa, smooth yellow violet Viola sororia, sister violet

VITACEAE

Parthenocissus quinquefolia, Virginia creeper

Parthenocissus vitacea, woodbine Vitis riparia, riverbank grape

ZANNICHELLIACEAE

Zannichellia palustris, horned pondweed

ZYGOPHYLLACEAE

Tribulus terrestris, puncture vine*

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