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THE VASCULAR FLORA OF BANNER COUNTY, NEBRASKA

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A botanical survey of Banner County resulted in a total of 432 species of vascular plants being recorded, representing 238 genera of 70 families. Two hundred seven of these species had not previously been collected in Banner County. One (*Penstemon buckleyi*) is newly collected for Nebraska. These collections represent four major plant communities: coniferous forest, native prairie, riparian and stream habitat, and disturbed sites. Banner County has four distinct topographical regions (Platte River Valley, Wildcat Hills, Pumpkin Creek Valley, and Cheyenne Tableland) that provide varying habitats for plants. The transition areas between these units have habitats that provide refugia for plants from other regions. A list of the plants recorded from Banner County with the areas where they are found is presented.

† † †

INTRODUCTION

Livestock ranching and small cereal farming are the primary land uses of Banner County, Nebraska. European settlement of Banner County began in the 1880s. Oil has been commercially produced since early 1951, and Minuteman missile silos have been in place since 1963. These activities have led to changes in the vegetation of the area. This study was undertaken to determine the flora that currently occurs in Banner County. Collections were limited to those species that occur naturally in the region and to the introduced plants that appear to be established outside cultivation. The political boundaries of Banner County delimit the collection area. Collection trips were made throughout the growing season of six years (1983, 1984, 1985, 1987, 1988 and 1989) at three-week intervals. Representative areas of the plant communities and habitats within the county were intensively collected, with

other areas being more lightly sampled. The areas receiving the most attention in each collection trip were alternated during the different collections and years to allow for thorough sampling of the entire county. The specimens were collected and processed according to standard taxonomic procedures. Specimen determinations were made following the treatment set forth by the Great Plains Flora Association (1986) in the *Flora of the Great Plains*. The habitat and frequency of occurrence of each species were observed and recorded. The specimens are deposited in the Chadron State College Herbarium at Chadron, Nebraska.

P. A. Rydberg collected in Banner County during the summers of 1890 and 1891 and deposited the specimens in the Charles E. Bessey Herbarium (NEB) at the University of Nebraska–Lincoln. H. A. (Steve) Stephens collected heavily throughout the Great Plains region during the 1960s and 1970s and deposited his specimens in the McGregor Herbarium at the University of Kansas (KANU). Monica Rohde-Fulton collected in Banner County in the summers of 1976 and 1977 and placed those plants in the Chadron State College Herbarium. These are the only major previous collections of plants from Banner County, as far as is known by the author. The diversity of habitats, as well as the diversity of plants collected, reveal that this area is rich in species.

LOCATION AND SIZE

Banner County is located in the southwestern portion of the Nebraska panhandle. It borders Scotts Bluff County on the north and Kimball County on the

south. Morrill and Cheyenne counties are east of Banner County, while the western border is formed by the Nebraska-Wyoming state line. The area included in Banner County is approximately 1930 square kilometers (745 square miles).

TOPOGRAPHY

The topography of the county may be separated into the following four broad categories: (1) a smooth and level area called the Cheyenne Tableland; (2) a broad lowland area called the Pumpkin Creek Valley; (3) a high range called the Wildcat Ridge; and (4) a small lowland area of the North Platte River Valley locally referred to as Horseshoe Bend (Fig. 1).

Banner County is located in the High Plains section in the Central Great Plains Province (Fenneman, 1931). The bedrock is mostly of lake and stream deposits but reworked volcanic material is present. The sediment material is mostly unconsolidated silt with small quantities of sand and

gravel. Lime is very abundant and often cements the sedimentary constituents into a coherent porous mass which is resistant to erosion (Fenneman, 1931). Gravel, sand, and clay carried from the Rocky Mountains during the Tertiary "were deposited over the whole area by heavily loaded streams which spread out fanlike, overflowing and depositing their materials widely" (Weaver and Albertson, 1956). This fluvial plain stretched from the Rocky Mountains on the west to the Central Lowland Province on the east. Originally this flat tableland covered the entire area, but erosion has significantly lowered portions of the original tableland by several hundred feet, resulting in extremely diverse topography in this region. Table areas of high-plains prairie are dissected by deep steep-sided canyons. At the bottom of many of these ravines meander intermittent streams. The Wildcat Ridge extends across the northern portion of the county, separating the broad Pumpkin Creek Valley from the North Platte River Valley in the extreme northeastern corner.

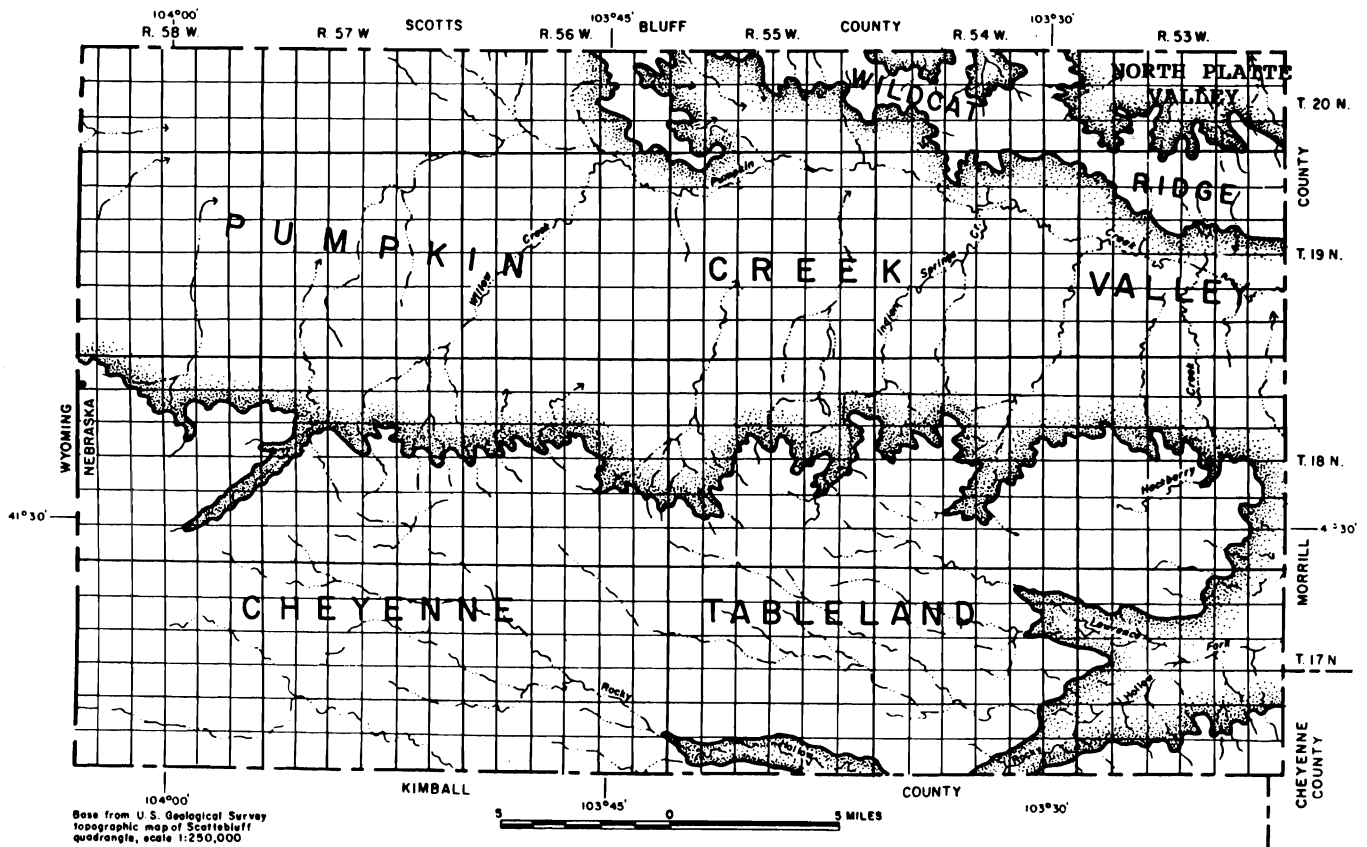


Figure 1. Topographic regions of Banner County, Nebraska

DRAINAGE

The Cheyenne Tableland is a remnant of the original plain, extending across the southern part of Banner County. The altitude of this area is approximately 1594 meters (5,230 feet) at the Wyoming State line. It slopes downward to the east at an average of 3.2 m per km (17 feet per mile), although at the eastern part of the county the slope is as much as 4.2 m per km (22 feet per mile) (Smith and Souders, 1975). The southwestern portion of the Cheyenne Tableland is mostly flat to slightly rolling, while the stream channels are poorly developed and occur mainly as shallow swales. The surface gradually becomes more rolling to the east until the tableland becomes extremely dissected and broken in the southeastern part of the county. The original surface of the tableland is present on the tops of the narrow divides and small flat hilltops in this area. The northern edge of the Cheyenne Tableland is an escarpment 61 to 122 meters (200 to 400 feet) above the plain below. The bases of these cliffs and vertical walls flatten to gentle slopes leading toward the Pumpkin Creek Valley.

The Pumpkin Creek Valley comprises about 40 percent of the total area of Banner County (Hayes and Bedell, 1921). Pumpkin Creek flows near the northern edge of its valley. The mostly flat floodplain lies from one-third to one meter (one to three feet) above the floodplain. The southern slope from these terraces to the Cheyenne Tableland is long and gentle while the northern slope toward the Wildcat Ridge is relatively short and steep.

The Wildcat Ridge is 213 to 229 meters (700 to 750 feet) above Pumpkin Creek and 30 to 61 meters (100 to 200 feet) lower than the Cheyenne Tableland. This extremely eroded remnant of the original tableland forms a high narrow divide between the Pumpkin Creek Valley and the North Platte River Valley. The surface ridge is rough and broken, with precipices bordering both sides. The northern escarpment drops abruptly to the North Platte River Valley, which is approximately 350 meters (1150 feet) below the Wildcat Ridge (Condra, 1926).

Immediately north of the Wildcat Ridge a small corner of the North Platte River Valley occupies the northeastern corner of Banner County. It slopes toward the North Platte River located in Scotts Bluff County. The lowest part of Banner County, slightly less than 1170 meters (3840 feet), is located here (Smith and Souders, 1975).

Approximately 91 square kilometers (35 square miles) in northeastern Banner County drain by ephemeral streams into the North Platte River. The remainder of the northern two-thirds of Banner County is drained by Pumpkin Creek, the only continuously flowing creek in the county. Pumpkin Creek flowed during the drought of the 1930s, but during the summers of the early 1980s the creek dried up in some areas. This may have been due to the combination of drought conditions and irrigation practices lowering the water table (Banner County Historical Society, 1982). Pumpkin Creek originates in southwestern Scotts Bluff County just north of the Banner County border. It is 0.6 to 1.2 meters (two to four feet) deep and is usually about a meter (3 feet) wide, although it widens out to approximately 6 meters (20 feet) in places. Pumpkin Creek is swift and erosive near its head but becomes sluggish near the eastern boundary of Banner County. It is fed entirely by groundwater seepage, springs, and intermittent drainageways. These drainageways are all on the south side of Pumpkin Creek, heading in the rough broken escarpments bordering the Cheyenne Tableland.

Most of the southeastern Cheyenne Tableland is drained by ephemeral streams flowing to Lawrence Fork, which empties into Pumpkin Creek 11 km (seven miles) east of the county line in Morrill County, Nebraska. About 124 square kilometers (48 square miles) of the southwestern tableland drains into Lodgepole Creek in Kimball County, Nebraska (Smith and Souders, 1975).

CLIMATE

Cold winters and short summers, with great extremes of temperature, characterize the climate of Banner County. The weather, as reviewed by Smith and Souders (1975), is "quite variable from year to year, season to season, and even day to day." Hunt (1967) reports the maximum temperature is about 38°C (100°F) and a minimum -29°C (-20°F) for this region, although these temperatures are surpassed during extreme weather conditions. The average temperature is 9°C (48°F). The average annual precipitation is about 40 cm (15.5 inches) with two-thirds of that occurring from May to September (Smith and Souders, 1975). The annual snowfall is greater than 51 cm (20 inches), the depth of frost penetration is 51 cm (20 inches), and the average length of the frost free period is 140 days (Hunt, 1967).

SOILS

Most soils of the tableland belong to the Rosebud series. These are moderately deep, well-drained soils with weathered sandstone bedrock at a depth of 51 to 102 cm (20 to 40 inches). These soils are slow to erode and have moderately good drainage. Topography of the Rosebud series varies from nearly flat to steeply rolling. Some areas are extremely eroded and white underlying formations are exposed. Rosebud loam is the most extensive soil in this series, followed by Rosebud silt loam and Rosebud very fine sandy loam. The Rosebud soils cover 35 percent of the county (Hayes and Bedell, 1921).

The rough broken lands of badly eroded bluffs and slopes constitute about 16 percent of Banner County. The topography is extremely rugged, with many steep slopes, canyons and gullies. Rock outcrops are common, and white calcareous stones are frequently found in the soils. Grasses grow well on areas where erosion is minimal, and trees and shrubs can be found in the breaks. Drainage in these locations is excessive due to the steep slopes.

Soils of the Epping series occupy the gently rolling to sloping and dissected valley lands adjacent to the rough broken lands. These are shallow, well-drained soils which weathered from siltstone (Ragon, et al., 1977). Soils of this series cover about 24 percent of Banner County (Hayes and Bedell, 1921). They are deficient in organic matter and are used mostly for pasture and hayland (Smith and Souders, 1975). Drainage is good, although in some areas it may be excessive.

Bridgeport soils occupy 15 percent of Banner County, forming the long, gently sloping fans of alluvial and colluvial materials of the upper terraces of Pumpkin Creek. The soils of the Bridgeport series are grayish-brown to brown colored and have good drainage. They are a recently formed soil, with little organic matter present. These soils are utilized mostly for livestock grazing, as they are susceptible to wind erosion when cultivated (Hayes and Bedell, 1921).

The remaining 10 percent of the soils belong to the following series: (1) Tripp series, alluvial material located on the terraces of Pumpkin Creek; (2) Cheyenne series, alluvial material deposited in stream valleys; (3) Mitchell series, windblown deposits on terrace-like benches; (4) Laurel series, highly calcareous soils near stream bottoms; (5) Valentine soils, windblown material derived from underlying Tertiary sandstone; (6) Dunlap series,

derived through weathering of the calcareous sandstones on flat tops of high tables; (7) Scotts soils, shallow basins of lacustrine origin, and (8) Dunesand, formed by wind deposits from surrounding sandy hills, which are subject to drifting and occur as isolated areas in Pumpkin Creek Valley (Hayes and Bedell, 1921).

These differing soils, in combination with varying slopes and exposures, form many differing microenvironments. The diversity of habitats present in Banner County provides refugia for plants on the edge of their ranges of distribution.

NATIVE VEGETATION

Shantz and Zon (1924) classified the area including Banner County as short-grass plains. This vegetation type is located east of the Rocky Mountains and, most generally, west of the 100th meridian. The grasses are mostly low growing and shallow rooted as a result of the relatively low rainfall. The short-grass plains occupy 14 percent of the total area of the United States, and can be broken into several distinct associations. The (blue) grama-buffalo grass association contains almost equal quantities of the two component grasses (*Buchloë dactyloides* and *Bouteloua gracilis*). It is the most typical short-grass association of the plains grassland. The western wheatgrass association is characterized by blue grama and buffalo grass sod with a scattered to common growth of western wheatgrass (*Agropyron smithii*). The grama-western needlegrass association has blue grama and green needlegrass (*Stipa viridula*) forming the large part of the grass cover.

Weaver and Clements (1938) considered the area including Banner County as the Short-grass Disclimax. They described this area as a portion of the mixed prairie where the less favorable rainfall resulted in the absence of the mid grasses. The idea that these short-grass plains are modified forms of mixed prairie is substantiated by the presence of mid-grasses in areas where sandy soil or topography result in increased availability of water. Their book was published during a severe drought cycle, which resulted in a drastic change in the plant composition (Weaver, 1965).

Oosting (1956) agreed with Weaver and Clements (1938) in classifying the original plant community as a mixed-grass community, with shorter dominant grasses of blue grama and buffalo grass being associated with western wheatgrass, little bluestem (*Andropogon scoparius*), Junegrass

(*Koeleria pyramidata*), needle-and-thread (*Stipa comata*), and sand dropseed (*Sporobolus cryptandrus*). The short-grass condition, termed a disclimax, was, Oosting stated, a result of overgrazing an area which would normally support a mixed prairie plant community.

Küchler (1964) outlined a grama-buffalo grass province for the area including Banner County. He described the plant structure as a "fairly dense grassland of short grass with somewhat taller grasses in the eastern section" of the entire vegetation type.

In 1965, Weaver stated that "the most significant difference of mixed prairie from true prairie is the almost universal presence of one or more short grasses or sedges as a lower layer under the mid grasses. The distinctive feature of the mixed prairie is the intimate mixing of mid grasses with the shorter ones." He continued, stating that buffalo grass, blue grama, and sedges (*Carex* species) form the understory, while sideoats grama (*Bouteloua curtipendula*), needle-and-thread, sand dropseed, Junegrass, and green needlegrass form the upper layer of the prairie. Weaver made a point of stating that sandy soil increases the availability of soil moisture for the plants, thereby permitting more mid grasses to grow in the area than what might normally be expected.

Kaul (1975) classified the original grasslands of Banner County as short-grass prairie. Jensen (in Bose, 1977) described this community as consisting primarily of prairie sandreed (*Calamovilfa longifolia*), western wheatgrass, needle-and-thread, blue grama, and threadleaf sedge (*Carex filifolia*). Associated grasses include sand bluestem (*Andropogon hallii*), buffalo grass, sand dropseed, green needlegrass, and Indian ricegrass (*Oryzopsis hymenoides*).

Daubenmire (1978) described steppe as a grassland of "areas where the zonal soils are too dry for trees and herbaceous perennial grasses are well represented." The few species of trees which are present occupy narrow and scattered bands along stream edges. The steppe region in North America was formed during the Pliocene when the Rocky Mountains reached a height sufficient to produce a rain shadow. The *Bouteloua gracilis* Province, he continued, is the largest of the North American Steppe Provinces. It occupies the driest portion of the rain shadow of the Rocky Mountains, including Banner County, Nebraska. In the northern section of this province blue grama dominates the mat-like

cover of short grasses. A rather diffuse layer of taller grasses is present in areas that receive extra water through pooling or run-in of rain water.

Vankat (1979) stated that the short-grass association "occupies the 'High Plains' and is composed chiefly of grasses 20 to 50 centimeters in height." Buffalo grass and blue grama are listed as the dominant grasses, with needle-and-thread and western wheatgrass also present. South-facing slopes receive more solar radiation and therefore have higher temperatures, increased evapotranspiration, and longer growing seasons than the near-by north-facing slopes or flat areas. "Species and plant communities may be restricted to south slopes at the northern edge of their range and north slopes at the southern edge." Similarly, east-facing and west-facing slopes can differ in their plant communities due to the difference in the time of day when direct radiation is received (Vankat, 1979).

As elevation increases, soil depth decreases, and/or as one continues farther westward the mid grasses become less dominant in the prairie. Albertson (1937) stated that the distribution of plant species is correlated to topography and soil environment. Their influence is due primarily to moisture availability, since water appears to be the major controlling factor in the distribution of prairie plant species.

CURRENT VEGETATION

The valley floors of Banner County are covered by a mixed-prairie plant community. The understory of blue grama and threadleaf sedge is overtopped by mid grasses such as needle-and-thread, Indian ricegrass, and western wheatgrass. Little bluestem and sand dropseed are also common. On shallow soils, dry areas, and overgrazed pastures the short grasses become more frequent. Buffalo grass is intermittently distributed throughout the county. It is present in patches of varying sizes on overgrazed areas and shallow soils. In most of Banner County it cannot be considered a dominant component of the vegetation.

Cottonwood (*Populus deltoides* subsp. *monilifera*), box elder (*Acer negundo*), willow (*Salix amygdaloides* and *S. exigua* subsp. *interior*), hackberry (*Celtis occidentalis*), green ash (*Fraxinus pennsylvanica*) and chokecherry (*Prunus virginiana*) often occur near Pumpkin Creek and many of the streambeds and ravines. Sedges, rushes (*Juncus* species), rabbitfoot grass (*Polypogon monspeliensis*) and forbs such as cat-tail (*Typha latifolia*)

lia), monkey flower (*Mimulus glabratus* var. *fremontii*), blue vervain (*Verbena hastata*) and milkweeds (*Asclepias* species) grow near the continuously wet streams, where they are especially prevalent in the marshy areas between the water and prairies.

Ponderosa pine (*Pinus ponderosa*) and juniper (*Juniperus scopulorum*) are common along the steep canyons and ridgetops of the Wildcat Ridge and Cheyenne Tableland escarpments. The open hill-sides between the pines exhibit a wide variety of grasses and forbs, such as Kentucky bluegrass (*Poa pratensis*), needle-and-thread, breadroot scurf-pea (*Psoralea esculenta*), Easter daisy (*Townsendia grandiflora*), and bluebells (*Mertensia lanceolata*). cryptanthas, eriogonums, draba milkvetch (*Astragalus spatulatus*), ball-head (*Ipomopsis congesta*), and stemless hymenoxys (*Hymenoxys acaulis*) are often present on shallow soils or bare outcroppings of both the Wildcat Ridge and the Cheyenne Tableland. Rocky outcrops of the Cheyenne Tableland provide habitat for dwarf locoweed (*Oxytropis multiceps*), Missouri milkvetch (*Astragalus missouriensis*), lotus milkvetch (*Astragalus lotiflorus*), and threadleaf sedge. Mountain mahogany (*Cercocarpus montanus*) forms dense thickets on localized tops of hills within the dissected Cheyenne Tableland, dominating the vegetation. Woodbine (*Parthenocissus vitacea*), poison ivy (*Toxicodendron rydbergii*), waterpod (*Ellisia nyctelea*), and western red currant (*Ribes cereum*) can be found in gullies and ravines. At the broad bottoms of larger canyons are often found wild plum (*Prunus americana*), chokecherry, aromatic sumac (*Rhus aromatica* var. *trilobata*) and dogbane (*Apocynum cannabinum*). Dry roadsides and field borders provide habitat for smooth brome (*Bromus inermis*) as well as many weedy species, such as the thistles (*Cirsium* species and *Carduus nutans*), knotweeds (*Polygonum* species), common purslane (*Portulaca oleracea*), clammy-weed (*Polanisia dodecandra* subsp. *trachysperma*), Rocky Mountain bee plant (*Cleome serrulata*), and lamb's quarters (*Chenopodium* species).

ANNOTATED SPECIES LIST

The following list contains all the plants found outside cultivation in Banner County, Nebraska. The plants listed have been collected from the field by the author, and are represented by voucher specimens in the Chadron State College Herbarium, or have been seen and verified by the author. Twelve species (*Agalinis tenuifolia* var. *parviflora*, *Antennaria microphylla*, *Carex diandra*, *Delphinium*

virescens subsp. *penardii*, *Erigeron bellidiastrum*, *Geum aleppicum*, *Lupinus plattensis*, *Machaeranthera grindelioides*, *Oenothera canescens*, *Prunus pumila* var. *besseyi*, *Solanum triflorum*, and *Thelypodium integrifolium*) were reported by Steven Rolfsmeier as being in the Charles E. Bessey Herbarium (NEB) and are included here.) Specimens located at herbaria other than the Chadron State College Herbarium are denoted by the herbarium's acronym in the description. The habitat and the frequency of occurrence of each species are given. The terms abundant, common, scattered, and rare are used as an indication of frequency within the species' appropriate habitat in Banner County. A species is considered abundant if large numbers of individual plants can easily be found, common if individual plants are found fairly often, scattered if the species is found occasionally, and rare if the plant is known from one or a few small colonies within the county.

The arrangement of the following list of species is alphabetical by family, genus, and species. Synonymy follows the Great Plains Flora Association (1986). Plants marked with a double asterisk (**) are newly recorded for Banner County, as compared to the *Atlas of the Flora of the Great Plains* (Great Plains Flora Association, 1977).

ACERACEAE (Maple Family)

Acer negundo var. *interius* (box elder). Scattered in deep ravines and along streams. **

Acer negundo var. *negundo* (box elder). Scattered along streams, in deep ravines, and in prairie. **

AGAVACEAE (Agave Family)

Yucca glauca (small soapweed). Scattered in prairies, open ponderosa pine forests, and at base of Wildcat Ridge.

ALISMATACEAE (Water Plantain Family)

Sagittaria latifolia (arrowhead). Rare in Pumpkin Creek, common in stock tank overflows. **

AMARANTHACEAE (Pigweed Family)

Amaranthus graecizans (prostrate pigweed). Common on disturbed sites. **

Amaranthus hybridus (slender pigweed, green pigweed). Common along newly disturbed roadsides of Highway #71; scattered elsewhere along roadsides. **

Amaranthus retroflexus (rough pigweed). Common in disturbed areas. **

ANACARDIACEAE (Cashew Family)

Rhus aromatica var. *trilobata* (fragrant sumac, polecat bush). Common along gulches and on slopes. **

Toxicodendron rydbergii (poison ivy). Common in draws and on sides of gulleys. **

APIACEAE (Parsley Family)

- Berula erecta* var. *incisum* (water-parsnip). Shallow water near springs. (NEB: Rydberg, August 1890).
Conium maculatum (poison hemlock). Rare along streams. **
Cymopterus acaulis. Scattered in upland prairies and hillsides.
Cymopterus montanus. Scattered on shallow soils under ponderosa pines. **
Lomatium foeniculaceum var. *foeniculaceum* (wild parsley). Scattered in short-grass prairie and on Wildcat Ridge. **
Lomatium orientale (wild parsley). Scattered in dry prairie. **
Musineon divaricatum. Scattered in rocky wheatgrass prairie in northwestern part.
Musineon tenuifolium. Scattered on dry roadcuts.
Osmorhiza longistylis var. *longistylis* (anise root). Rare in shaded ravines. **

APOCYNACEAE (Dogbane Family)

- Apocynum cannabinum* (Indian hemp dogbane, prairie dogbane). Scattered in gulch bottoms. **

ASCLEPIADACEAE (Milkweed Family)

- Asclepias arenaria* (sand milkweed). Common along dry roadsides. **
Asclepias engelmanniana (Engelmann's milkweed). Calcareous outcroppings of Cheyenne Tableland. (NEB: Rydberg, August 1891).
Asclepias incarnata (swamp milkweed). Scattered along Pumpkin Creek. **
Asclepias pumila (plains milkweed). Common in prairie.
Asclepias speciosa (showy milkweed). Common in roadside ditches.
Asclepias syriaca (common milkweed). Scattered along Pumpkin Creek. **
Asclepias verticillata (whorled milkweed). Moist soils and prairie. (KANU: Richardson #1566, August 1965).
Asclepias viridiflora (green milkweed). Widely scattered in prairie.

ASTERACEAE (Sunflower Family)

- Achillea millefolium* subsp. *lanulosa* (yarrow). Common on disturbed soils. **
Ambrosia artemisiifolia (common ragweed). Common on disturbed soils. **
Ambrosia psilostachya (western ragweed). Common on disturbed soils. **
Ambrosia tomentosa (perennial bursage). Scattered along roadsides. **
Ambrosia trifida (giant ragweed). Common on disturbed roadsides and along fields.
Antennaria microphylla (pink pussytoes). Pumpkin Seed Valley. (NEB: Rydberg. July 1891; identified by J. G. Chmielewski, 1987).
Antennaria parvifolia (pussy-toes). Abundant under ponderosa pines and scattered in prairies. **

- Arctium minus* (common burdock). Widely scattered in disturbed areas, especially in deep shade or moist soils. **
Artemisia campestris subsp. *caudata* (western sagewort). Scattered on lower slopes of gulches and on bluffs.
Artemisia cana (dwarf sagebrush). Widely scattered along roadsides and in western mid-grass prairie. **
Artemisia dracunculus (silky wormwood). Scattered in draws, gulches, and prairies. **
Artemisia filifolia (sand sagebrush). Common in prairies.
Artemisia frigida (fringed sage). Scattered in prairies, rims and draws of canyons, and on disturbed soils. **
Artemisia ludoviciana var. *ludoviciana* (white sage). Widely scattered in prairies and draws. **
Aster commutatus (wild aster). Widely scattered in prairies. **
Aster ericoides (white aster). Common in draws of upland prairies.
Aster falcatus (wild aster). Scattered on damp to drying soils in prairies and near streams.
Aster praealtus var. *nebraskensis* (willowleaf aster). Rare near springs in dense shade. **
Bidens cernua (nodding beggar-ticks). Scattered along stream margins.
Bidens frondosa (beggar-ticks). Scattered along stream margins and in drying disturbed areas. **
Brickellia grandiflora. Open areas of Wildcat Ridge. (NEB: Rydberg, August 1890).
Carduus nutans subsp. *leiophyllus* (musk thistle, nodding thistle). Locally common in fields, widely scattered in roadside ditches. **
Chrysopsis horrida (golden aster). Widely scattered in western prairies.
Chrysopsis villosa var. *hispida* (golden aster). Scattered on midslopes of Wildcat Ridge and on prairie outcroppings.
Chrysopsis villosa var. *villosa* (golden aster). Common in prairies, roadsides, and on disturbed soils.
Chrysothamnus parryi subsp. *howardii* (Parry's rabbit brush). Rare on bare sandstone bluffs of Wildcat Ridge. **
Cirsium arvense (Canada or field thistle). Locally abundant in moist soils, ditches, fields, and near Pumpkin Creek.
Cirsium canescens (Platte thistle). Scattered in roadside ditches and prairies.
Cirsium flodmanii (Flodman's thistle). Rare along roadsides and near creeks. **
Cirsium undulatum (wavy-leaf thistle). Scattered in dry prairies.
Cirsium vulgare (bull thistle). Scattered along roadsides, pastures, and disturbed sites. **
Conyza canadensis (horse-weed). Common on disturbed sites. **
Coreopsis tinctoria (Plains coreopsis). Rare in roadside ditches and prairie.
Crepis acuminata (hawk's-beard). Dry prairie. (KANU: Stephens #40888, June 1970).

- Crepis occidentalis* (hawk's-beard). Rare in western prairies. **
- Crepis runcinata* (hawk's-beard). Rare on saline soils of damp and drying sites near Pumpkin Creek.
- Dyssodia papposa* (fetid marigold). Locally abundant in trail roads, along open fields, and other disturbed locations. **
- Erigeron bellidiastrum* (western fleabane). Lawrence Fork. (NEB: Rydberg, July 1890),
- Erigeron pumilus* (fleabane). Common along roadsides, in prairies, and on lower slopes of Wildcat Ridge.
- Eupatorium purpureum* (sweet joe-pye weed). Locally common in grassy roadside ditch of Highway #88W near Pumpkin Creek. **
- Grindelia squarrosa* var. *squarrosa* (curly-top gumweed). Abundant along roadsides and in prairies. **
- Gutierrezia sarothrae* (snakeweed). Scattered in prairies, especially in dry upland areas.
- Haplopappus annuus* (goldenweed). Widely scattered along dry roadsides in western part. **
- Haplopappus armerioides* (goldenweed). Rare on sandstone outcroppings in western prairies.
- Haplopappus spinulosus* subsp. *spinulosus* (cutleaf iron-plant). Scattered in native prairie.
- Helianthus annuus* (annual sunflower). Common along roadsides and on disturbed sites.
- Helianthus nuttallii* subsp. *rydbergii* (Nuttall's sunflower). Rare along roadsides in southern part. **
- Helianthus petiolaris* (plains sunflower). Common in dry roadsides and disturbed areas.
- Hymenopappus filifolius* var. *polycephalus*. Scattered along roadsides and in shallow soils of outcrops.
- Hymenoxys acaulis* (stemless hymenoxys). Common in shallow soils over outcroppings and on Wildcat Ridge.
- Iva xanthifolia* (marsh elder). Widely scattered along Pumpkin Creek. **
- Kuhnia eupatorioides* var. *corymbulosa* (false boneset). Scattered in prairies. **
- Lactuca oblongifolia* (blue lettuce). Common on roadside banks and ditches and near streams.
- Lactuca serriola* (prickly lettuce). Common in wet sites and disturbed areas. **
- Liatis punctata* (gay feather, blazing star). Common in prairies and open ponderosa pine forests.
- Lygodesmia juncea* (skeletonweed). Common in road cuts, along roadsides, and in prairies.
- Machaeranthera canescens* (hoary aster). Scattered on upper slopes of bluffs in Wildcat Ridge. **
- Machaeranthera grindelioides* (goldenweed). Sand draws, Hills of Pumpkin Seed Valley, Upper Lawrence Fork. (NEB: Rydberg, August 1890, July and August 1891).
- Machaeranthera linearis*. Common on old roads and primary floodplains of streams. **
- Microseris cuspidata*. Common in upland prairies.
- Ratibida columnifera* (prairie coneflower). Common in native prairie and along roadsides.
- Senecio canus* (gray ragwort). Scattered along roadsides and in prairies.
- Senecio integerrimus* var. *exaltatus* (groundsel). Common in prairies and draws. **
- Senecio integerrimus* var. *integerrimus* (groundsel). Scattered in dense vegetation at base of gulches and ravines and in prairies. **
- Senecio plattensis* (prairie ragwort). Scattered in mid-grass prairie and along roadsides.
- Senecio riddellii* (Riddell ragwort). Scattered on roadcuts, slopes, and in prairie.
- Silphium integrifolium* var. *laeve* (rosin-weed). Widely scattered along Highway #71 near junction with Highway #88E. **
- Silphium laciniatum* (compass plant). Scattered along Highway #71 just north of junction with Highway #88E. **
- Solidago canadensis* var. *scabra*. Along roads. (KANU: Croat #3338, September 1966).
- Solidago canadensis* var. *gilvocanescens* (Canada goldenrod). Common along creeks and in damp soils. **
- Solidago gigantea* (late goldenrod). Rare in moist open areas near streams.
- Solidago missouriensis* (prairie goldenrod). Common in prairies and on hillsides.
- Solidago mollis* (soft goldenrod). Scattered in prairie and open ponderosa pine forest.
- Solidago nemoralis* (gray goldenrod). Common in grassy roadside ditches and edges of gullies. **
- Taraxacum officinale* (common dandelion). Scattered along roadsides and in disturbed areas. **
- Thelesperma filifolium* var. *intermedium* (greenthread). Common in pastures and along roadsides.
- Thelesperma megapotamicum*. Widely scattered in open prairies and near ponderosa pines.
- Townsendia exscapa* (Easter daisy). Common on shallow soils of outcrops in prairie and on upper slopes of Wildcat Ridge. **
- Townsendia grandiflora* (Easter daisy). Scattered on shallow soils of outcrops in prairie and on Wildcat Ridge.
- Tragopogon dubius* (goat's beard, western salsify). Scattered along roadsides and in prairie.
- Xanthium strumarium* (cocklebur). Scattered near streams. **

BORAGINACEAE (Borage Family)

- Cryptantha cana*. Scattered in disturbed areas of prairie.
- Cryptantha celosioides*. Scattered on shallow soils in prairie.
- Cryptantha fendleri*. Scattered in dry sandy prairie and canyons.
- Cryptantha jamesii*. Scattered in prairie, in open areas of ponderosa pine forest, and on disturbed sites.
- Cryptantha minima*. Scattered in dry prairie on disturbed sites. **
- Cryptantha thyrsoflora*. Common in open ponderosa pine forest and on shallow soils.
- Hackelia floribunda* (large-flowered stickseed). Rare along streams and in deep ravines.
- Heliotropium curassavicum* (heliotrope). Damp saline soils near Pumpkin Creek. (NEB: Rydberg, July 1891).

Lappula redowskii (stickseed). Abundant on disturbed soils.

Lappula texana (cupseed stickseed). Scattered in disturbed areas of prairie.

Lithospermum incisum (puccoon). Common in prairies and under ponderosa pines.

Mertensia lanceolata (bluebells). Abundant under ponderosa pines and scattered in prairies and road ditches.

BRASSICACEAE (Mustard Family)

Alyssum alyssoides (pale alyssum). Scattered in western part on disturbed soils. **

Arabis hirsuta var. *pyncocarpa* (rock cress). Rare under ponderosa pines on escarpments of Cheyenne Tableland. **

Arabis holboellii var. *pinetorum* (rock cress). Widely scattered on shallow soils and outcroppings.

Brassica juncea (Indian mustard). Locally common near Pumpkin Creek. **

Camelina microcarpa (small-seeded false flax). Rare in shallow and disturbed soils. **

Capsella bursa-pastoris (shepherd's purse). Common in disturbed soils along roadsides, fields, and in prairie. **

Chorispora tenella (blue mustard). Common in disturbed areas.

Descurainia pinnata subsp. *brachycarpa* (tansy mustard). Abundant in dry disturbed sites along roadsides, fields, and near stock tanks.

Descurainia sophia (flixweed). Common in disturbed areas. **

Draba nemorosa (yellow whitlowort). Widely scattered on lower slopes and draws of gulches near Cheyenne Tableland. **

Draba reptans (white whitlowort). Present with *D. nemorosa*. **

Erysimum asperum (western wallflower). Common in prairie.

Lepidium densiflorum (peppergrass). Very common on disturbed sites. **

Lesquerella alpina (bladderpod). Scattered on rocky outcrops in prairie (KANU: Stephens #28152, May 1970)

Lesquerella ludoviciana (bladderpod). Scattered on disturbed areas, roadcuts, and under ponderosa pines.

Lesquerella montana. Widely scattered in dry wash areas of ravines. **

Nasturtium officinale (watercress). Common along edges of streams in shallow water. **

Raphanus sativus (radish). Collected along Highway #71 in southern part. **

Rorippa palustris subsp. *hispida* var. *hispida* (yellow bog cress). Common along edges of Pumpkin Creek. **

Sisymbrium altissimum (tumbling mustard). Common in disturbed ground. **

Thelypodium integrifolium. Low meadow, upper Pumpkin Valley (NEB: Rydberg, July 1891).

Thlaspi arvense (field pennycress). Scattered along roadsides and in old fields. **

CACTACEAE (Cactus Family)

Coryphantha vivipara var. *vivipara* (pincushion cactus). Widely scattered in dry areas of prairie and persisting under ponderosa pines. **

Echinocereus viridiflorus (hedgehog cactus). Widely scattered throughout prairie. **

Opuntia fragilis (little prickly pear). Scattered through prairie. **

Opuntia macrorhiza var. *macrorhiza* (plains prickly pear). Common in prairie. **

CAESALPINIACEAE (Caesalpinia Family)

Gleditsia triacanthos forma *inermis* (thornless honey locust). Commonly planted around homesteads and persists. **

CAMPANULACEAE (Bellflower Family)

Campanula rotundifolia (harebell). Scattered under ponderosa pines and in nearby prairies. **

Lobelia siphilitica (blue cardinal flower, great lobelia). Rare in shady damp soils near streams.

CANNABACEAE (Hemp Family)

Cannabis sativa (hemp, marijuana). Rare along streams. **

CAPPARACEAE (Caper Family)

Cleome serrulata (Rocky Mountain bee plant). Very common on disturbed soils along roadsides, in ravines, and in prairies.

Polanisia dodecandra subsp. *trachysperma* (clammy-weed). Scattered in washes and draws on disturbed soils.

CAPRIFOLIACEAE (Honeysuckle Family)

Symphoricarpos occidentalis (western snowberry, wolfberry). Common in draws and prairie ravines.

CARYOPHYLLACEAE (Pink Family)

Arenaria hookeri var. *hookeri* (sandwort). Common on rocky slopes and shallow soils of Wildcat Ridge and Cheyenne Tableland.

Cerastium brachypodum (mouse-ear chickweed). Widely scattered at base of gulch walls and in shaded disturbed areas. **

Paronychia depressa (whitlow-wort, nailwort). Common on shallow soils and rocky outcrops of Cheyenne Tableland prairie and on upper slopes of Wildcat Ridge.

Paronychia sessiliflora (whitlow-wort, nailwort). Widely scattered on upper bare slopes of Wildcat Ridge. **

CHENOPODIACEAE (Goosefoot Family)

Ceratoides lanata (white sage, winter fat). Scattered along base of Wildcat Ridge and in western prairie.

Chenopodium album (lamb's quarters). Scattered on disturbed soils. **

Chenopodium berlandieri (pitseed goosefoot). Common in dry disturbed areas. **

Chenopodium fremontii (Fremont goosefoot). Scattered in shaded areas among dense vegetation along Pumpkin Creek. **

Chenopodium incanum (lamb's quarters). Common on dry disturbed soils of prairie.

Kochia scoparia (kochia, fire-weed). Common along roadsides and in disturbed areas. **

Salsola iberica (Russian-thistle, tumbleweed). Common along roadsides and disturbed sites. **

COMMELINACEAE (Spiderwort Family)

Tradescantia bracteata (spiderwort). Scattered in roadside ditches and swales of prairie. **

Tradescantia occidentalis (spiderwort). Common in prairies and on disturbed sites. **

CONVOLVULACEAE (Morning-glory Family)

Convolvulus arvensis (field bindweed). Locally abundant in fields and disturbed areas. **

Ipomoea leptophylla (bush morning-glory). Scattered in prairie.

CUCURBITACEAE (Cucumber Family)

Cucurbita foetidissima (buffalo-gourd). Widely scattered in roadside ditches in southeastern part.

Echinocystis lobata (wild cucumber). Rare in damp soils near streams. **

CUPRESSACEAE (Cypress Family)

Juniperus scopulorum (Rocky Mountain Juniper). Common in draws and gulches with ponderosa pines. **

Juniperus virginiana (red cedar). Rare in the northeastern portion of Banner County and in planted shelterbelts.

CUSCUTACEAE (Dodder Family)

Cuscuta indecora (large alfalfa dodder). Prairie. (NEB: Rydberg, August 1890).

CYPERACEAE (Sedge Family)

Carex aquatilis var. *altior*. Common near streams. **

Carex brevior (fescue sedge). Scattered at head of canyons in deep shade. **

Carex diandra. Slough in prairie, 10 mi south of Melbeta [Scotts Bluff County]. (KANU: Stephens #5508, June 1966).

Carex filifolia (threadleaf sedge). Abundant on shallow soils over outcroppings, under ponderosa pine trees, and in native prairie.

Carex nebraskensis (Nebraska sedge). Scattered near Pumpkin Creek and streams.

Carex praegracilis. Moist soils. (KANU: Stephens #5502, June 1966).

Carex sprengellii. Scattered in shade of trees in canyons. **

Carex stricta. Shallow water. (Stephens #5507, June 1966).

Cyperus rivularis (umbrella sedge). Scattered near streams in wet soils. **

Eleocharis erythropoda (spikerush). Abundant near streams in wet soils. **

Eleocharis macrostachya (spikerush). Common in tank overflows and along streams.

Eleocharis xyridiformis (spikerush). Locally abundant along streams. **

Scirpus pungens (bulrush). Scattered along Pumpkin Creek, in stock tank overflows, and along intermittent streams.

Scirpus validus (bulrush). Common along Pumpkin Creek and in marshy areas. **

ELAEAGNACEAE (Olive Family)

Elaeagnus angustifolia (Russian olive). Scattered in moist soils along Pumpkin Creek, in shelterbelts, and along yards.

EQUISETACEAE (Horsetail Family)

Equisetum arvense (field horsetail). Scattered in moist soils, mostly in the western part. **

Equisetum laevigatum (smooth scouring rush). Common along dry roadsides and in meadows.

EUPHORBIACEAE (Spurge Family)

Croton texensis (Texas croton). Scattered in prairie and on disturbed soils.

Euphorbia dentata (toothed spurge). Rare along creek banks, roadsides, and in prairie.

Euphorbia fendleri (Fendler's euphorbia). Dry prairies and roadsides. (NEB: Churchill #3777, July 1974).

Euphorbia geyeri (Geyer's spurge). Scattered in disturbed sites. **

Euphorbia glyptosperma (ridge-seeded spurge). Common on disturbed sites. **

Euphorbia missurica (Missouri spurge, prairie spurge). Rare on disturbed shallow soils under ponderosa pines.

Euphorbia robusta. Dry prairies on rocky hills and ridges. (NEB: Rydberg, August 1890).

FABACEAE (Bean Family)

Astragalus adsurgens var. *robustior* (standing milk-vetch). Scattered on dry roadcuts, banks, and in Wildcat Ridge.

Astragalus agrestis (field milk-vetch). Scattered in moist prairies in draws, and near streams. **

Astragalus ceramicus var. *filifolius* (painted milk-vetch). Sandy soils of Cheyenne Tableland prairie. (NEB: Rydberg, July 1891).

Astragalus crassicaarpus var. *crassicaarpus* (ground-plum). Common in prairies.

Astragalus crassicaarpus var. *paysoni* (ground-plum). Rare in native prairie.

Astragalus gilviflorus (plains orophaca). Rocky hilltops and slopes. (NEB: Rydberg, August 1890)

Asatragalus gracilis (slender milk-vetch). Scattered in prairie.

Astragalus lotiflorus (lotus milk-vetch). Rare in roadcuts and on dry pebbly hillsides in southeastern part.

Astragalus missouriensis (Missouri milk-vetch). Widely scattered on pebbly outcrops in prairie and on Wildcat Ridge.

Astragalus mollissimus (woolly locoweed). Rare in native wheatgrass prairie in northwestern part. **

Astragalus sericoleucus (silky orophaca). Scattered on rocky open ridges.

Astragalus shortianus. Gravelly outcroppings in prairie. (KANU: Stephens #38263, May 1970).

Astragalus spatulatus (draba milk-vetch). Scattered on Wildcat Ridge and other shallow soils.

Coronilla varia (crown vetch). Locally common on slopes and widely scattered on draw in Big Horn Gulch. **

Dalea candida var. *candida* (white prairie-clover). Rare in prairie.

Dalea candida var. *oligophylla* (white prairie clover). Scattered in prairie.

Dalea purpurea var. *purpurea* (purple prairie clover). Scattered in prairie and along roadsides.

Glycyrrhiza lepidota (wild licorice). Common along roadsides, on slopes above creeks, in prairie ravines, and on dry creekbeds. **

Lathyrus polymorphus (hoary vetchling). Common in draws and roadcuts, and scattered in prairie.

Lupinus argenteus var. *argenteus* (silvery lupine). Scattered to common along roadsides and prairie hillsides.

Lupinus plattensis (Platte lupine). Canyon northwest of Flowerfield (NEB: Tolstead #12933, July 1953).

Lupinus pusillus (small or rusty lupine). Scattered on sandy sites in prairie. **

Medicago lupulina (black medic). Scattered in wet areas near streams and along yards and gardens. **

Medicago sativa subsp. *sativa* (alfalfa). Occasionally escapes cultivated fields and occurs in pastures and roadsides. **

Melilotus alba (white sweet clover). Rare on disturbed sites. **

Melilotus officinalis (yellow sweet clover). Abundant on disturbed sites, in old fields, and along roadsides. **

Oxytropis lambertii (purple locoweed). Common in prairies and along pebbly roadsides.

Oxytropis multiceps (dwarf locoweed). Five small populations found on pebbly hillside outcrops of Cheyenne Tableland.

Oxytropis sericea (white locoweed). Scattered on rocky prairie outcrops.

Psoralea argophylla (silver-leaf scurf pea). Common in prairie.

Psoralea esculenta (breadroot scurf-pea, prairie turnip). Locally common on rocky outcrops and in prairies near pine-covered ravines.

Psoralea lanceolata (lemon scurf-pea). Common in prairies and along roadsides.

Psoralea tenuiflora var. *tenuiflora* (wild alfalfa, scurfy pea). Common on disturbed sites and scattered through prairies.

Thermopsis rhombifolia var. *rhombifolia* (prairie buck-bean, yellow pea). Common in prairies and under ponderosa pines. **

Trifolium pratense (red clover). Widely scattered along roadsides. **

Trifolium repens (white clover, ladino clover). Scattered along streams and around yards. **

Vicia americana var. *minor* (American vetch). Scattered on lower slopes of prairies and along roadsides.

Vicia villosa var. *villosa* (hairy vetch, woollypod vetch). Planted along new roadsides. **

FUMARIACEAE (Fumitory Family)

Corydalis aurea subsp. *occidentalis* (golden corydalis). Rare in open prairie and woodlands.

GROSSULARIACEAE (Currant Family)

Ribes cereum var. *inebrians* (western red currant). Scattered in draws and along ravines.

Ribes odoratum (buffalo currant). Scattered on lower slopes of gulches along edge of Cheyenne Tableland.

HYDROPHYLLACEAE (Waterleaf Family)

Ellisia nyctelea (waterpod). Locally common on bottoms of sandy washes and scattered on disturbed soils. **

JUNCACEAE (Rush Family)

Juncus alpinus. Scattered along slow-moving streams. **

Juncus balticus (Baltic rush). Common in marshy areas near streams and stock tank overflows.

Juncus bufonius (toad rush). Stream marshes. (NEB: Rydberg, August 1890).

Juncus dudleyi (Dudley rush). Stream marshes. (NEB: Rydberg, July 1891).

Juncus effusus (bog rush). Common in drying flats near streams. **

Juncus interior (inland rush). Stream marshes. (NEB: Rydberg, July 1891).

Juncus longistylis. Widely scattered along Pumpkin Creek. **

Juncus marginatus (grassleaf rush). Scattered in wet soil near Pumpkin Creek. **

Juncus nodosus (knotted rush). Common along slow-moving streams and in stock tank overflows. **

Juncus tenuis (path rush). Rare in disturbed areas along streams.

Juncus torreyi (Torrey's rush). Scattered along slow-moving creeks.

JUNCAGINACEAE (Arrowgrass Family)

Triglochin maritima var. *elata* (arrowgrass). Locally common in marshy areas near Pumpkin Creek.

LAMIACEAE (Mint Family)

Hedeoma drummondii (Drummond false pennyroyal). Scattered on disturbed soils and gravelly outcrops.

Hedeoma hispidum (rough false pennyroyal). Scattered on disturbed soils and in prairies. **

Leonurus cardiaca (motherwort). Scattered in wet soils near Pumpkin Creek. **

Lycopus americanus (American bugleweed). Wet soils. (NEB: Rydberg, August 1890).

Lycopus asper (rough bugleweed). Scattered in wet soils near streams. **

Mentha arvensis (field mint). Scattered along streams and in deep moist ravines. **

Monarda fistulosa var. *fistulosa*. (wild bergamot). Damp soils. (NEB: Rydberg, July 1891).

Monarda fistulosa var. *menthifolia* (wild bergamot). Widely scattered under trees near streams.

Monarda pectinata (spotted or plains beebalm). Widely scattered in prairies, especially on disturbed sites.

Nepeta cataria (catnip). Locally common along roadsides, stream banks, and in ravines. **

Salvia azurea (blue sage, Pitcher sage). Locally scattered along Highway #71 and Highway #88E junction. **

Salvia reflexa (Rocky Mountain or lance-leaved sage). Scattered in disturbed sites near roadsides, fields, and in wash areas. **

LEMNACEAE (Duckweed Family)

Lemna minor (duckweed). Scattered in quiet water of streams and stock tank overflows.

LILIACEAE (Lily Family)

Allium textile (wild onion). Common in prairies and under ponderosa pine trees.

Asparagus officinalis (asparagus). Scattered in shady areas of ravines and near streams. **

Leucocrinum montanum (mountain lily). Common on open hillsides of ponderosa pine forests and on shallow soils over outcroppings or rocky knolls.

Smilacina stellata (spikenard). Locally abundant in deep shady ravines and near streams in moist soils. **

Zigadenus venenosus var. *gramineus* (death camas). Scattered in prairies and in open areas near ponderosa pines.

LINACEAE (Flax Family)

Linum rigidum var. *rigidum* (stiffstem flax). Common along roadsides and in prairie. **

LOASACEAE (Stickleaf Family)

Mentzelia nuda (blazing star, sand lily, stickleaf). Scattered in disturbed areas and on shallow soils over outcrops.

MALVACEAE (Mallow Family)

Malva rotundifolia (common mallow). Scattered in disturbed areas. **

Sphaeralcea coccinea (red false mallow). Scattered in prairies and along roadsides.

MOLLUGINACEAE (Carpetweed Family)

Mollugo verticillata (carpetweed). Locally abundant in draws in shade of trees. **

NYCTAGINACEAE (Four-o'clock Family)

Abronia fragrans (sweet sand verbena). Scattered through prairies and along roadsides.

Mirabilis hirsuta (hairy four-o'clock). Scattered through prairies and along roadsides.

Mirabilis linearis (narrowleaf four-o'clock). Rare in open prairie near ponderosa pines.

Mirabilis nyctaginea (wild four o'clock). Common in open prairies and along roadsides. **

OLEACEAE (Olive Family)

Fraxinus pennsylvanica (red or green ash). Scattered along streambanks and in ravines.

ONAGRACEAE (Evening Primrose Family)

Calylophus lavandulifolius (lavender leaf primrose). Rare in dry roadcuts.

Calylophus serrulatus (plains yellow primrose). Common in prairies, roadcuts, and draws.

Epilobium ciliatum subsp. *ciliatum* (willow-herb). Scattered along intermittent streams. **

Gaura coccinea (scarlet gaura). Scattered along roadsides, on outcrops, and in prairies.

Gaura parviflora (velvety gaura). Common along roadsides and scattered in prairies.

Oenothera albicaulis (prairie or pale evening primrose). Scattered on disturbed soils of prairie and along roadsides.

Oenothera biennis (common evening primrose). Scattered in damp soils along Pumpkin Creek and in roadside draws. **

Oenothera canescens (spotted evening primrose). Hills. (NEB: Rydberg August 1890; id. W.L. Wagner, 1930)

Oenothera caespitosa subsp. *caespitosa* (gumbo evening primrose, gumbo lily). Widely scattered on dry, rocky or gravelly hillsides.

Oenothera coronopifolia (combleaf evening primrose). Rare at bottoms of ravines and in prairie. **

Oenothera latifolia (pale evening primrose). Rare in prairie. **

Oenothera villosa (common evening primrose). Scattered in stream valleys, prairie, and along roadside. **

OROBANCHACEAE (Broomrape Family)

Orobanche ludoviciana (broomrape). Native upland prairie. (NEB: Rydberg, July 1891).

PAPAVERACEAE (Poppy Family)

Argemone polyanthemus (prickly poppy). Common along dry roadsides and in prairies.

Eschscholzia californica (California poppy). In newly seeded roadside ditches of Highway #71. **

PINACEAE (Pine Family)

Pinus ponderosa (ponderosa pine). Abundant in ravines along the Wildcat Ridge and Cheyenne Tableland.

PLANTAGINACEAE (Plantain Family)

Plantago eriopoda (alkali plantain). Locally common in marshy meadows near Pumpkin Creek.

Plantago lanceolata (English plantain, buckhorn). Scattered along Pumpkin Creek near Hwy #88W. **

Plantago major (common plantain). Scattered in disturbed sites.

Plantago patagonica var. *patagonica*. (Patagonian plantain). Abundant in disturbed sites.

POACEAE (Grass Family)

Agropyron caninum subsp. *majus* (slender wheatgrass). Scattered in prairie.

- Agropyron cristatum* (crested wheatgrass). Scattered in roadside ditches, disturbed areas, and prairies. **
- Agropyron dasystachyum* (thickspike wheatgrass). Scattered in roadside ditches, disturbed areas, and prairies. **
- Agropyron elongatum* (tall wheatgrass). Locally abundant in lowland area along Pumpkin Creek and in the Wildcat Ridge prairie. **
- Agropyron intermedium* var. *intermedium* (intermediate wheatgrass). Scattered in prairie and along roadside. **
- Agropyron smithii* (western wheatgrass). Abundant in western prairies and common in rest of prairies.
- Agrostis stolonifera* (redtop). Scattered along streams and in low moist ground.
- Alopecurus aequalis* (short foxtail). Scattered in wet areas near streams.
- Andropogon hallii* (sand bluestem). Locally common in sandy soil, especially at base of Wildcat Ridge.
- Andropogon scoparius* (little bluestem). Common in prairies, on rims and sides of canyons.
- Aristida purpurea* var. *longiseta* (three-awn). Scattered in disturbed areas of native prairie.
- Aristida purpurea* var. *purpurea* (purple three-awn). Scattered in disturbed areas of prairie.
- Bouteloua curtipendula* (sideoats grama). Common in draws and on shallow soils of prairie.
- Bouteloua gracilis* (blue grama). Common in prairie, abundant on shallow soils and under ponderosa pines. **
- Bouteloua hirsuta* (hairy grama). Widely scattered on shallow soils over outcroppings. **
- Bromus inermis* subsp. *inermis* (smooth brome). Locally abundant in ditches and along roadsides. **
- Bromus japonicus* (Japanese brome). Scattered in dry disturbed sites.
- Bromus tectorum* (downy brome). Common along roadsides and in dry disturbed areas.
- Buchloë dactyloides* (buffalo grass). Widely scattered in prairies and along dry roadsides. **
- Calamovilfa longifolia* (prairie sandreed). Common in prairies and roadsides, especially at base of the Wildcat Ridge.
- Catabrosa aquatica* (brookgrass). Common in and near Willow Creek. **
- Cenchrus longispinus* (sandbur). Locally common on disturbed ground and along roadsides. **
- Dactylis glomerata* (orchard grass). Scattered along lower roadsides near Pumpkin Creek and in other moist sites. **
- Distichlis spicata* var. *stricta* (inland saltgrass). Common along roadsides near creeks.
- Echinochloa crusgalli* (barnyard grass). Locally common along stream edges and in disturbed drying sites. **
- Echinochloa muricata* var. *microstachya* (barnyard grass). Widely scattered near Pumpkin Creek in damp soil. **
- Elymus canadensis* (Canada wild rye). Widely scattered in drying soils of prairie.
- Elymus villosus* (hairy wild rye). Rare on moist soils in deep canyons. **
- Elymus virginicus* (Virginia wild rye). Widely scattered in drying areas of prairie and in washes. **
- Eragrostis cilianensis* (stinkgrass). Common on disturbed soils. **
- Festuca arundinacea* (tall fescue). Locally common in hay meadows in northern part. **
- Festuca octoflora* (sixweeks fescue). Common along roadsides and on shallow soils over outcroppings. **
- Hordeum jubatum* (foxtail barley). Common in prairie and disturbed areas. **
- Hordeum pusillum* (little barley). Common on bare areas of Wildcat Ridge. **
- Koeleria pyramidata* (Junegrass). Common on rocky areas, disturbed sites, and under ponderosa pines.
- Muhlenbergia cuspidata* (plains muhly). Dry prairies. (NEB: Rydberg, August 1891).
- Muhlenbergia pungens* (blowout grass, sand muhly). Scattered on sandy soils.
- Munroa squarrosa* (false buffalograss). Scattered in disturbed areas along Highway #88W. **
- Oryzopsis hymenoides* (Indian ricegrass). Abundant in prairies and along roadsides.
- Panicum capillare* (common witchgrass). Scattered in disturbed ground and along roadsides.
- Panicum virgatum* (switchgrass). Scattered in moist lowland areas.
- Phleum pratense* (timothy). Locally scattered on lower slopes of canyons and in ditches. **
- Poa compressa* (Canada bluegrass). Disturbed moist areas. (KANU: Stephens #5505).
- Poa palustris* (fowl bluegrass). Scattered along intermittent drainageways. **
- Poa pratensis* (Kentucky bluegrass). Common near creeks, stock tank overflows, under ponderosa pines, and in yards. **
- Poa sandbergii* (Sandberg's bluegrass). Rare on bluff sides and in gulches. **
- Polypogon monspeliensis* (rabbitfoot grass). Common along Pumpkin Creek. **
- Schedonnardus paniculatus* (tumblegrass). Widely scattered at base of Wildcat Ridge. **
- Setaria glauca* (yellow foxtail). Common along roadsides. **
- Setaria viridis* (green foxtail). Scattered along roadsides and in draws. **
- Sitanion hystrix* var. *brevifolium* (squirreltail). Rare in dry soils of pastures and roadsides.
- Spartina gracilis* (alkali cordgrass). Scattered along Pumpkin Creek.
- Sporobolus cryptandrus* (sand dropseed). Common in roadside ditches and prairies.
- Stipa comata* (needle-and-thread). Common to abundant in roadside ditches and prairies, especially on Cheyenne Tableland. **
- Stipa viridula* (green needlegrass). Common in prairie, especially on Cheyenne Tableland. **
- Triticum aestivum* (wheat). Abundant along dry roadsides and in cultivated fields. **

POLEMONIACEAE (Polemonium Family)

- Collomia linearis* (collomia). Common in prairie in western part. **
- Ipomopsis congesta* subsp. *congesta* (ball-head). Scattered on upper bare slopes of Wildcat Ridge and on shallow soils of prairie.
- Ipomopsis spicata* (spike gilia). Scattered on rocky outcrops in prairies and in disturbed soils.
- Microsteris gracilis*. Scattered on dry stream beds and gravelly outcrops in prairie. **
- Phlox andicola* (plains phlox). Common on shallow soils in prairie and on upper slopes of Wildcat Ridge.
- Phlox hoodii* (Hood's phlox). Scattered in prairie on shallow soils and on upper slopes of Wildcat Ridge.

POLYGONACEAE (Buckwheat Family)

- Eriogonum alatum* var. *alatum*. Rare in rocky prairie draws on north side of Cheyenne Tableland.
- Eriogonum annuum* (annual eriogonum). Common in disturbed areas of prairies and along roadsides.
- Eriogonum cernuum* (nodding wild buckwheat). Rare in open sandy grasslands and hillsides. (NEB: Rydberg, August 1890).
- Eriogonum effusum* var. *effusum* (spreading wild buckwheat). Rare in prairie and on rocky outcrops toward western part.
- Eriogonum flavum* (yellow wild buckwheat). Common on gravelly knolls and shallow soils in prairie.
- Eriogonum pauciflorum* var. *pauciflorum* (wild buckwheat). Common on bare slopes of Wildcat Ridge and scattered in shallow soils of Cheyenne Tableland.
- Polygonum arenastrum* (knotweed). Scattered along roadsides and in disturbed areas.
- Polygonum aviculare* (knotweed). Scattered to locally common in dry disturbed sites. **
- Polygonum convolvulus* (climbing or wild buckwheat). Scattered on disturbed soils and in roadside ditches. **
- Polygonum lapathifolium* (pale smartweed). Common near springs and on damp soils. **
- Polygonum pennsylvanicum* (Pennsylvania smartweed). Scattered in wet soils near Pumpkin Creek and intermittent streams. **
- Polygonum persicaria* (lady's thumb). Scattered in damp soils near intermittent streams. **
- Polygonum ramosissimum* (knotweed). Common in damp soils and scattered on disturbed sites. **
- Rumex crispus* (curly dock). Scattered in disturbed areas. **
- Rumex maritimus* (golden dock). Rare along Pumpkin Creek. **
- Rumex venosus* (wild begonia). Common on disturbed sites and along roadsides.

POLYPODIACEAE (True Fern Family)

- Cheilanthes feei* (slender lip fern). Exposed sandstone outcrops. (NEB: Rydberg, August 1890).
- Cystopteris fragilis* (fragile fern). Rare in moist areas, especially in deep ravines under trees. **

PORTULACACEAE (Purslane Family)

- Portulaca oleracea* (common purslane). Common in cultivated and disturbed sites. **

POTAMOGETONACEAE (Pondweed Family)

- Potamogeton pectinatus* (sago pondweed). Creeks. (NEB: Rydberg, August 1891).

RANUNCULACEAE (Buttercup Family)

- Clematis ligusticifolia* (western clematis). Widely scattered on banks, bushes, and trees.
- Delphinium nuttallianum* (blue larkspur). Scattered in prairie draws and under ponderosa pines.
- Delphinium virescens* subsp. *penardii* (prairie larkspur). Hills north of Lawrence Fork (NEB: Rydberg, July 1891).
- Ranunculus cymbalaria* (shore buttercup). Scattered near seepage areas and stream banks.
- Thalictrum venulosum* (early meadow rue). Rare in shaded gulches. **

ROSACEAE (Rose Family)

- Agrimonia striata* (striate agrimony). Scattered at base of ravines and along shaded streams.
- Cercocarpus montanus* (mountain mahogany). Locally abundant on rocky hilltops and scattered on rims of western canyons.
- Geum aleppicum* (yellow avens). Lawrence Fork (NEB: Rydberg, July 1891).
- Geum canadense* (white avens). Scattered under trees near streams. **
- Potentilla recta* (sulphur cinquefoil). Scattered along roadside ditches of Highway #88. **
- Prunus americana* (wild plum). Common along steep sides of gulches and canyons. **
- Prunus pumila* var. *besseyi* (sand cherry). Lawrence Fork (NEB: Rydberg, July 1891).
- Prunus virginiana* (chokecherry). Common in canyons and woodlands. **
- Rosa arkansana* (prairie wild rose). Scattered along roadsides and in prairies. **
- Rosa woodsii* (western wild rose). Scattered in draws and prairies and along fence rows.

RUBIACEAE (Madder Family)

- Galium aparine* (catchweed bedstraw). Common in moist soils and along roadsides. **
- Galium boreale* (northern bedstraw). Common on rocky hillsides and along roads.

SALICACEAE (Willow Family)

- Populus deltoides* subsp. *monilifera* (cottonwood). Common along Pumpkin Creek and in damp soils. **
- Salix amygdaloides* (peachleaf willow). Common in wet soils near streams.
- Salix exigua* subsp. *interior* (sandbar willow). Scattered in damp soils near streams.

SANTALACEAE (Sandlewood Family)

- Comandra umbellata* subsp. *pallida* (false toadflax). Scattered on upper rims of canyons.

SCROPHULARIACEAE (Figwort Family)

- Agalinis tenuifolia* var. *parviflora*. Lawrence Fork (NEB: Rydberg, 1890; identified by Pennell in 1924).
- Besseyia wyomingensis* (kitten-tails). Rare on open slopes in western part. **
- Castilleja sessiliflora* (downy paintbrush). Common on shallow soils in prairie.
- Mimulus glabratus* var. *fremontii* (roundleaf monkey-flower). Common in slow moving streams.
- Penstemon albidus* (white beardtongue). Scattered in prairie.
- Penstemon angustifolius* var. *angustifolius* (narrow beardtongue). Rare on lower slopes of Wildcat Ridge and northern prairies. **
- Penstemon angustifolius* var. *caudatus* (narrow beardtongue). Common in prairie.
- Penstemon buckleyi* (Buckley's penstemon). Found in one location in Big Horn Gulch. **
- Penstemon cobaea* (Cobaea penstemon). Rare in three small colonies along Highway #71. **
- Penstemon glaber* var. *glaber* (smooth penstemon). Rare on upper slopes of Wildcat Ridge and in western prairie.
- Penstemon grandiflorus* (large beardtongue). Rare along Highway #71. **
- Scrophularia lanceolata* (figwort). Scattered in draws in northeastern prairies. **
- Verbascum thapsus* (common mullein). Rare along drainage ditches and roadways.
- Veronica americana* (brooklime speedwell). Common in slow-moving streams.
- Veronica anagallis-aquatica* (water speedwell). Common in Pumpkin Creek and in slow-moving streams. **

SOLANACEAE (Potato or Nightshade Family)

- Physalis hederifolia* var. *comata* (ground cherry). Prairies (NEB: Rydberg, 1891).
- Physalis longifolia* (common ground cherry). Scattered on disturbed soils.
- Physalis pumila* subsp. *hispida* (prairie ground cherry). Scattered along roadsides and in disturbed sites in prairie.
- Physalis virginiana* (Virginia ground cherry). Rare along roadsides. **
- Solanum rostratum* (buffalo bur, Kansas thistle). Locally abundant in disturbed areas.
- Solanum triflorum* (cut-leaved nightshade). Prairie dog towns, Lawrence Fork (NEB).

SPARGANIACEAE (Bur-reed Family)

- Sparganium eurycarpum* (bur-reed). Common along Pumpkin Creek in shallow water and marshy areas. **

TYPHACEAE (Cat-tail Family)

- Typha latifolia* (broad-leaved cat-tail). Abundant along Pumpkin Creek and scattered in stock tank overflows. **

ULMACEAE (Elm Family)

- Celtis occidentalis* (hackberry). Scattered along stream-banks and on floodplains.
- Ulmus americana* (American elm). Rare along streams and in planted shelterbelts. **
- Ulmus pumila* (Siberian elm). Common around homesteads and in shelterbelts. **

URTICACEAE (Nettle Family)

- Parietaria pensylvanica* (Pennsylvania pellitory). Scattered in shaded areas of gulches and under trees. **
- Urtica dioica* subsp. *gracilis* (stinging nettle). Common in damp soils of draws and along streams. **

VERBENACEAE (Vervain Family)

- Phryma leptostachya* (lopseed). Moist areas of stream valleys. NEB: Rydberg, August 1890).
- Verbena bracteata* (prostrate vervain). Common on disturbed sites and along roadsides.
- Verbena hastata* (blue vervain). Common in damp soils along streams.
- Verbena stricta* (hoary vervain). Scattered in prairie, gulches, and disturbed areas.

VIOLACEAE (Violet Family)

- Viola nuttallii* (Nuttall's violet, yellow prairie violet). Very common on dry hillsides and scattered in prairie.

VITACEAE (Grape Family)

- Parthenocissus vitacea* (woodbine, thicket creeper). Locally abundant near streams.
- Vitis riparia* (river-bank grape). Common in shaded areas near streams. **

ZANNICHELLIACEAE (Horned Pondweed Family)

- Zannichellia palustris* (horned pondweed). Common in a stock tank with a sandy bottom in Long Canyon and probably elsewhere.

ZYGOPHYLLACEAE (Caltrop Family)

- Tribulus terrestris* (puncture vine, goat head). Common in disturbed areas. **

DISCUSSION

The dicot group of plants (Magnoliopsida) are far more abundant in occurrence than the monocots (Liliopsida), the fern-allies (Pteridophyta) or the conifers (Pinophyta). The dicots account for 76 percent of the total number of species, genera, and families (Table I).

Largest families in numbers of species

Eleven families contain a total of 279 species. This is over 64 percent of the species from just under 15 percent of the total families. The two largest families, Poaceae and Asteraceae, contain nearly one-third of the species. The number of species in the ten largest families are: Asteraceae 79; Poaceae 55;

Table I. Cumulative List of Plant Groups.

	Families	Genera	Species
Pteridophytes	2	3	4
Pinophyta	2	2	3
Magnoliophyta			
Magnoliopsida	53	180	330
Liliopsida	13	53	95
Total	70	238	432

Fabaceae 36; Brassicaceae 22; Polygonaceae 16; Cyperaceae 14; Scrophulariaceae 14; Boraginaceae 12; Onagraceae 12; Lamiaceae 11; and Juncaceae 11. Although members of the Poaceae form the major components of most of the plant communities, the diversity within the family is less than in Asteraceae.

Interesting species distribution

Extension of Ranges: The following species newly found in Banner County are disjunct from previously known ranges and therefore of special interest: *Coronilla varia*, *Eschscholzia californica*, *Potentilla recta*, *Salvia azurea*, *Silphium integrifolium*, and *Silphium laciniatum*.

Eastern Species: Plants that exhibit an eastern distribution and are near the western edge of their range in Banner County include: *Brassica juncea*, *Eupatorium purpureum*, and *Geum canadense*.

Southern Species: The following species from Banner County are at or near the northern limits of their range: *Asclepias engelmanniana*, *Brickellia grandiflora*, *Chrysopsis horrida*, *Cucurbita foetidissima*, *Echinocereus viridiflorus*, *Eriogonum alatum* var. *alatum*, *Haplopappus annuus*, *Oenothera canescens* and *Penstemon angustifolius* var. *caudatus*.

Western Species: Twenty-three species representative of the western flora at the eastern edge of their range were found: *Alyssum alyssoides*, *Ambrosia tomentosa*, *Arenaria hookeri*, *Astragalus crassicaarpus* var. *paysoni*, *Astragalus shortianus*, *Ceratoides lanata*, *Cercocarpus montanus*, *Crepis acuminata*, *Delphinium nuttallianum*, *Euphorbia fendleri*, *Euphorbia robusta*, *Eriogonum cernuum*, *Eriogonum effusum* var. *effusum*, *Haplopappus armerioides*, *Ipomopsis spicata*, *Mertensia lanceolata*, *Microsteris gracilis*, *Musineon divaricatum*, *Oenothera caespitosa*, *Paronychia sessiliflora*, *Penstemon glaber* var. *glaber*, *Poa sandbergii*, and *Ribes cereum* var. *inebrians*.

Northern Plants: Many of the plants presented in the western species section exhibit a northwestern distribution. No plants with strictly northeastern distribution were collected in Banner County. The eight species presented below are of a more northern range: *Astragalus gilviflorus*, *Catabrosa aquatica*, *Collomia linearis*, *Draba nemorosa*, *Eriogonum pauciflorum* var. *pauciflorum*, *Hackelia floribunda*, *Ipomopsis congesta*, and *Penstemon glaber* var. *glaber*.

Endemic Plants: Eleven species are possibly endemic to the general area including western Nebraska, according to the Great Plains Flora Association (1986). Endemic plants are restricted to narrow ranges of distribution. These species are: *Aster praealtus* var. *nebraskensis*, *Astragalus hyalinus*, *Astragalus sericoleucus*, *Besseya wyomingensis*, *Cryptantha fendleri*, *Chrysothamnus parryi* subsp. *howardii*, *Eriogonum cernuum*, *Lesquerella montana*, *Musineon tenuifolium*, *Oxytropis multiceps*, and *Paronychia depressa*.

Rare Species: *Corydalis aurea* var. *occidentalis* has a broad distribution but is seldom collected. Due to its rarity of collection it is included here as an interesting plant from the county. *Cryptantha fendleri* is also infrequent in the Great Plains.

Species Newly Recorded for Nebraska: This is the first collection of *Penstemon buckleyi* in Nebraska, as far as the author is aware. This penstemon was found where Longhorn cattle had been imported from Texas, and the author speculates that seed from the plant was transported on their coats or in their feces. Determination was done by Craig C. Freeman, State Biological Survey of Kansas. The plants persisted for at least two seasons, but in the summer of 1989 the author could not locate the small population.

Excluded Species:

The following species are listed by the Great Plains Flora Association (1977) as being in Banner County, although the author has not seen specimens to verify their determinations: *Alisma triviale*, *Astragalus hyalinus*, *Carex lanuginosa*, *Chenopodium standleyanum*, *Erigeron canus*, *Euphorbia cyathophora*, *Fimbristylis puberula* var. *interior*, *Lemna trisulca*, *Muhlenbergia asperifolia*, *Muhlenbergia racemosa*, *Oenothera laciniata*, *Oryzopsis micrantha*, *Polygonum punctatum*, *Polygonum scandens*, *Rorippa truncata*, and *Scirpus pallidus*.

Species which may be present:

Species listed for neighboring counties in the *Atlas of the Flora of the Great Plains* which may be present in Banner County include: *Amaranthus albus*, *Astragalus pectinatus*, *Atriplex argentea* subsp. *argentea*, *Atriplex canescens*, *Bidens comosa*, *Bidens vulgata*, *Carex eleocharis*, *Cycloloma atriplicifolium*, *Linum rigidum* var. *compactum*, *Orobanche fasciculata*, *Orthocarpus luteus*, *Polygala alba*, *Potamogeton foliosus*, *Ranunculus longirostris*, *Ranunculus macounii*, *Rorippa sinuata*, *Rumex stenophyllus*, *Scutellaria galericulata*, *Shepherdia argentea*, *Sorghastrum nutans*, *Spartina pectinata*, *Sporobolus airoides*, and *Teucrium canadense*.

This is only the third floristic study completed for the Nebraska panhandle (The others are Nixon, 1967, and Urbatsch and Eddy, 1973). Vegetational studies of Agate Fossil Beds National Monument and Scotts Bluff National Monument involving the author and Ronald Weedon of Chadron State College are in progress, and H. Karcher has been conducting an ongoing floristic inventory of Morrill County, Nebraska. This study resulted in a greater floristic diversity from the relatively small area than what was originally expected. The Pine Ridge of northwestern Nebraska and the Wildcat Hills found here provide refugial areas for plants from outside this region. This area is a previously unexplored key region for edge-of-range species. Further floristic studies in this region will have great merit, particularly with respect to increasing our understanding of Great Plains vegetation and the biogeographical distribution of plant species.

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Note added in proof: Three additional collections were located by Steve Rolfsmeier at NEB at a date too late to include them in the text of this paper. They are *Euphorbia hexagona* from "Canyons of Banner County" (Rydberg, Aug 1890), *Lactuca ludoviciana* from "Lawrence Fork"

(Rydberg, 10 Jul 1891), and *Suaeda depressa* from "Saline meadow, Pumpkin Seed Valley" (Rydberg, 16 Jul 1891).

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