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WOODY PLANTS OF THE LOWER PLATTE VALLEY: AN ANNOTATED CHECKLIST

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A botanical survey of woody plants was made within the Lower Platte Valley in Dodge, Saunders, Douglas, Sarpy, and Cass counties, Nebraska. The following checklist of 50 woody plants is based on the quantitative analysis of 21 sites within the above counties. Species description, habitat type, and frequency of occurrence is given for each species.

† † †

INTRODUCTION

Although the exact extent of the Lower Platte Valley is subject to some speculation, for this report it is defined as the lower 96 km of the river above its confluence with the Missouri. The Lower Platte Valley consists of a variety of habitats and represents an extension of Oak–Hickory forest from the southeast intermixed with the Cottonwood/Ash/Elm Association of river valleys to the west. The terrain varies from nearly level lowlands on the floodplain that decline from 0.6 to 1.0 m/km to extremely steep, rocky uplands with slopes that average 20° to 50°. The parent material includes Dakota sandstone, Pennsylvanian limestones, and shales of the Kansas City, Lansing, Douglas, and Pleasanton groups (Burchett et al., 1975). The bottomland soils of the Lower Platte Valley are alluvial loams and sands of the Inavale–Cass–Wann Association (Bartlett and Koepke, 1979). Uneven ridges or natural levees alternate with old river channels on these bottomlands. Some of the old channels are very poorly–drained and contain some standing water during most or all of the growing season. The habitats in these clearings can be classified as Emergent Wetlands (Cowardin et al., 1979) containing Shallow Marsh Zones and Wet Meadow Zones as described by Stewart and Kantrud (1971). This wide variety of sites, ranging from poorly–drained lowlands to well–drained uplands, provides habitats for many different woody plant species and helps to account for the diversity of the area.

METHODS

Data in this paper were obtained by quantitatively sampling 21 separate sites by the point-centered quarter method during the summers of 1981–1985 (Rothenberger, 1985). Because the point–centered quarter method included only trees with diameters $\geq$ 2.54 cm, plant collections were made and a species checklist was developed for shrubs, seedlings, and other woody species previously excluded. The sites are designated as:

U = Upland Sites with elevations 5–60 m above the flood plain;
T = Transition Sites along natural levees 2–4 m above river level;
RB = Riverbottom Sites with average elevations of 0–2 m above river level.

Species distributions are indicated by a modified abundance scale (Mueller–Dombois, 1974) in which:

	frequency
1 = abundant	80–100%
2 = common	60–80%
3 = frequent	40–60%
4 = occasional	20–40%
5 = rare	0–20%

The code following each species description (example: RB–1, T–2, U–1) indicates both habitat and abundance within each vegetation type. Nomenclature for each species follows the Great Plains Flora Association (1986) and Stephens (1973).

LIST OF SPECIES

Gymnospermae

CUPRESSACEAE

Juniperus virginiana L., red cedar. Found at all elevations in our area in openings and clearings. It is not shade tolerant but is widely used as a windbreak planting. (RB–4, T–1, U–2)

Angiospermae

ULMACEAE

Celtis occidentalis L., hackberry. This tree is found at all elevations and ranges across the State where moisture permits. The largest single hackberry measured had a diameter of .54 m (1.8 ft). (RB–3, T–2, U–3)

Ulmus americana L., American elm. Dutch elm disease has drastically reduced its numbers. It adapts well to most soil types. All of the American elms recorded were small or medium trees. (RB–3, T–2, U–4)

Ulmus rubra Muhl., slippery elm. Red or slippery elm is a more disease-resistant variety that grows best on moist lowland sites. It was found at all elevations but is less abundant on drier uplands that give way to grassy clearings. (RB–1, T–2, U–1)

MORACEAE

Maclura pomifera (Raf.) Schneid., Osage orange. This small to medium–sized tree is occasionally planted along fence–rows and shelter belts. It rarely escapes into ravines, roadside thickets, and upland sites. I have collected it only in Sarpy and Saunders counties. (U–5)

Morus alba L., white mulberry. White mulberry is much more common along fence rows and clearings than in dense forest. It is a significant small tree in eastern Nebraska but was not frequently encountered in my samples. (T–4, U–5)

Morus rubra L., red mulberry. Red mulberry may reach a height of 18 m and occupies moist, shaded sites within the floodplain forest. It is considered to be a southeastern species but is very adaptable and is an important medium-sized tree in the Lower Platte Valley. (RB–1, T–1, U–3)

JUGLANDACEAE

Carya cordiformis (Wang.) K. Koch, bitternut hickory. A common species on uplands, bitternut hickory extends approximately 24 km west of Fremont along the south side of the river. It is reported only from Cass, Dodge, Douglas, and Sarpy counties along the Platte River (Great Plains Flora Association, 1977). (U–1)

Juglans nigra L., black walnut. Encountered on both upland and lowland sites in good soil. It avoids frequently innundated sandy sites on the floodplain. (RB–4, T–4, U–1)

FAGACEAE

Quercus bicolor Willd., swamp white oak. A single tree labeled as this tree at Schramm State Park is actually *Q. macrocarpa*. Pool (1951) reported swamp white oak as far north as the southeastern corner of Cass County. However, reports of it in Nebraska are based upon cultivated trees.

Quercus borealis Michx. var. *maxima* (Marsh.) Ashe, red oak. This tree is restricted to uplands and hillsides above the floodplain. It dominates areas where moisture conditions are favorable but drops out in favor of black oak on the semiarid uplands. The largest red oak encountered measured 1.1 m (3.6 ft) in diameter. (U–1)

Quercus macrocarpa Michx., bur oak. Our most common oak, it resists the seasonal drought imposed on the uplands as well as temporary inundation at lower elevations. It thrives in sandy loam on well drained sites but does not expand onto the floodplain. (RB–5, T–1, U–1)

Quercus velutina Lam., black oak. This upland oak tolerates poor soils and occurs at higher elevations than red oak. Both *Q. velutina* and *Q. borealis* fail to advance west of the confluence of the Elkhorn and Platte rivers even though *Q. borealis* is common on the bluffs of the Elkhorn in Dodge and Washington counties. (U–3)

BETULACEAE

Corylus americana Walt., American hazelnut. This shrub was found in thickets bordering upland forests. I recorded it as uncommon, but it does tend to form thick borders along stands of upland forest. (U–4)

Ostrya virginiana (Mill.) K.Koch, hop–hornbean. Hop–hornbean or ironwood prefers shaded, well drained slopes and apparently does not advance to the west of Dodge County along the Platte, even though it is common to almost the entire Niobrara Valley in north-central Nebraska. (U–2)

TILIACEAE

Tilia americana L. American linden. An important tree that dominates some lowland and upland sites. An interesting feature is its ability to quickly send up sucker shoots when injured or disturbed. This often results in large trees with multiple trunks. (RB–3, T–1, U–1)

SALICACEAE

Populus alba L., silver poplar. An introduced, rapidly growing tree to 20 m originally planted around old farmsteads. It reproduces vegetatively by sending up numerous shoots from root stocks and is very weedy in abandoned or disturbed lots. Only two small thickets (2–4 m) were noted along the margins of upland sites. (U–5)

Populus deltoides Marsh. ssp. *monilifera* (Ait.) Eckenw., cottonwood. A common species that dominates the forests found on the floodplain. Under favorable moisture conditions, it advances into the uplands but is restricted to the valley bottoms and lower slopes. (RB–1, T–2, U–3)

Salix amygdaloides Anderss., peach–leaved willow. A larger willow sometimes approaching 20 m in height, it is encountered along wetlands and flooded meadows. (RB–3)

Salix exigua Nutt. ssp. *interior* (Rowlee) Cronq., coyote willow. Found along streambanks in sandy soil and does occasionally escape into higher sites along natural levees and valley bottoms. It is common on river sandbars and helps to stabilize newly formed areas of deposition. (RB–4, U–5)

Salix nigra Marsh., black willow. Black willow is a southeastern species near the west edge of its range. It occurs within a variety of soils on moist sites. (RB–2)

GROSSULARIACEAE

Ribes missouriense Nutt., Missouri gooseberry. This common shrub seldom exceeds 1 m and grows well in moist woods and thickets and on upland sites. (RB–2, T–1, U–4)

ROSACEAE

Amelanchier arborea (Michx.) Fern., juneberry. A small tree or shrub found on slopes and well drained sites on the floodplain. (RB–4, U–5)

Crataegus mollis (T. & G.) Scheele, downy hawthorn. A tree sometimes as high as 5 m, it is the most common hawthorn in southeastern Nebraska. It was infrequently encountered in lowland forest. (RB–5)

Prunus americana Marsh., wild plum. A common species in thickets along roadsides and in clearings. It does not grow well under permanently established canopies. (RB–4, U–5)

Prunus virginiana L., choke cherry. A small tree rarely exceeding 5 m in height, it grows well on the floodplain and in thickets that border upland sites. (RB–3, T–1, U–3)

Rosa arkansana Porter, prairie wild rose. A small shrub rarely exceeding 0.5 m, it was occasionally encountered in open grassy margins of upland sites. (U–4)

Rubus occidentalis L. black raspberry. Black raspberry forms small thickets with the arching canes sometimes 2–3 m long. It is rare above the confluence of the Elkhorn and Platte rivers, and was more frequently encountered at sites along the lower 40 km of the Platte. (RB–5, U–4)

FABACEAE

Amorpha fruticosa L., false indigo. False indigo prefers moist, sandy stream banks and openings along the edges of woodlands. It is a clustered shrub with dense, purple spike-like racemes. (RB–3, T–3)

Gleditsia triacanthos L., honey locust. This hardy tree can utilize a variety of habitats. It grows well on the bottomlands and can withstand the more arid conditions that frequently occur on south-facing slopes. (RB–2, T–4, U–4)

Gymnocladus dioica (L.) Koch, Kentucky coffee tree. This eastern tree has moved into the Lower Platte Valley from the Missouri River and favors upland sites. Its range extends much farther west along the Niobrara River (e. Cherry County) than along the Platte, where it drops out of the widening floodplain forest west of Saunders and Dodge counties. (RB–5, U–3)

Robinia pseudoacacia L., black locust. Black locust was infrequently encountered along the grassy edges of upland sites. It prefers sunny openings and clearings. (U–5)

ELAEAGNACEAE

Elaeagnus angustifolia L., Russian olive. This introduced species is scarce in the study area even though it is common within the Platte's floodplain throughout central and western Nebraska. It is utilized extensively as a windbreak planting in the upper Great Plains and provides both food and cover for birds. (RB–4)

CORNACEAE

Cornus amomum Mill. ssp. *obliqua* (Raf.) J. S. Wils., pale dogwood. A thicket-forming shrub uncommon on lower sites. (RB–5, T–2)

Cornus drummondii Meyer, rough-leaved dogwood. A very common shrub of lowland and upland sites. In the understory of dense woodlands it grows as a small tree rarely exceeding 5 m. (RB–1, T–1, U–3)

Cornus stolonifera Michx., red osier dogwood. A shrub with clustered stems growing commonly in moist soil along stream banks and openings. (RB–5, U–5)

CELASTRACEAE

Celastrus scandens L., climbing bittersweet. A common vine in eastern deciduous forests but one that was rarely seen in my sample sites. The branches bearing brilliant red fruits are used in winter bouquets and are apparently overharvested in our area. (RB–5, U–5)

Euonymus atropurpureus Jacq., wahoo. A rare shrub usually 1–2 m high observed at only 2 riverbottom sites. Because of its brilliant red foliage, it is undoubtedly easier to locate in the fall. (RB–5)

RHAMNACEAE

Rhamnus cathartica L., common buchthorn. An introduced shrub that adapts to most habitats. (RB–4, T–2)

VITACEAE

Parthenocissus vitacea (Knerr) Hitch., woodbine. An extremely common vine along fence rows and in lowland forests. (RB–1, T–1, U–1)

Vitis riparia Michx., river–bank grape. A vine growing to 20 m that occupies a variety of soil types. It grows along stream banks, ravines, and woodlands. (RB–2, T–4, U–4)

ACERACEAE

Acer negundo L., box elder. A short, sometimes stocky tree to 15 m that thrives on the floodplain. It assumes a more compact, crooked growth form on upland sites. (RB–3, T–3, U–4)

Acer saccharinum L., silver maple. A rapid–growing tree with a large spreading canopy. It prefers low, moist sites and was once used extensively for plantings around farmsteads and homes. (RB–3)

ANACARDIACEAE

Rhus aromatica Ait. var. *serotina* (Greene) Rehd., aromatic sumac. A shrub to 2 m forming small thickets along the margins of upland sites. Although this plant tolerates dry, rocky sites it was not frequently encountered in my surveys. (U–5)

Rhus glabra L., smooth sumac. A shrub that sometimes exceeds a height of 3 m, it is a border species along the grassy margins of uplands and drained lowland sites. It is a wide ranging plant found throughout the upland prairie of the Northern Great Plains. (RB–2, T–2, U–3)

Toxicodendron radicans (L.) O. Ktze. ssp. *negundo* (Greene) Gillis, poison ivy. In the Lower Platte River Valley, this species is a vine sometimes exceeding 20 m in length. It frequents ditch banks, woodlands, and pastures. In the Northern Great Plains, it is colonial shrub. (RB–1, T–1, U–2)

RUTACEAE

Zanthoxylum americanum Mill., prickly ash. A thicket–forming shrub found in wooded uplands and lowlands. It is somewhat shade tolerant and produces fruit, leaves, and bark used in various home remedies. (RB–4, T–1, U–4)

OLEACEAE

Fraxinus americana L., white ash. White ash was reported in the Fremont area by Becker (1980). Pool (1951) restricts it to southeastern Nebraska only as far north as Douglas and Sarpy counties. It is either a rare tree or it was confused with *Fraxinus pennsylvanica* var. *subintegerrima*. *(RB–5)*

Fraxinus pennsylvanica Marsh. var. *subintegerrima* (Vahl.) Fern., green ash. An important medium-sized tree in floodplain sites and uplands. It is easily transplanted and was once used as a common timber–claim tree during the homestead period in Nebraska (Pool 1951). (RB–1, T–1, U–2)

CAPRIFOLIACEAE

Sambucus canadensis L., elderberry. This shrub may reach 2–3 m and is more common along fence rows and the edges of lowland forests than in the forests themselves. It is frequently utilized by birds and mammals when the dark purple fruit is ripe. (RB–4, U–5)

DISCUSSION

The vegetation is subject to long–term successional changes, but occasional biotic and climatic factors have been responsible for rapid fluctuations in the distribution of some species. For example, Dutch elm disease (*Ceratocystis ulmi*) has had a devastating effect on *Ulmus americana* populations since the early 1960's. Water and ice action associated with spring flooding have caused tree losses within the floodplain forest. Downburst winds and flash–flooding resulting from severe thunderstorms have also had a significant effect. Flash–flooding is most noteworthy along small, rapidly flowing tributaries such as Cedar, Turkey, and Four–Mile creeks in Cass County. Downburst winds caused losses of large *Tilia americana* and *Populus deltoides* branches and entire trees from Fremont to near Valley on June 12, 1980. Species distribution and dominance data taken before and after these disturbances sometimes vary greatly.

Much of the woodland along the Lower Platte River is in transition and is subject to a variety of anthropogenic disturbances. Although housing developments, gravel excavation, and limestone quarries have taken their toll, some large tracts such as Schramm State Park and Platte River State Park are protected and have been developed minimally. Other areas are privately owned and human use remains low. This insures that at least some of the Lower Platte's woodlands will continue to provide a storehouse of genetic material for woody species of the future as well as an aesthetic richness for all of us to enjoy.

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