

Nebraska—Crossroads of Tree Species

SIMPLY TREES March 2013

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Here in Nebraska, we often think of ourselves as a Great Plains state. While this is an accurate description of the region, it might lead to the assumption that Nebraska is fairly uniform from east to west, north to south. If you have ever driven across the state on roads other than Interstate 80, you know that it is far from a homogeneous landscape.

Nebraska lies at a sort of ecological crossroads between the northern and southern Great Plains, straddling the divide between eastern woodlands and western prairies. The state's political borders encompass the meeting places of several frontiers, making it a unique place to enjoy tree and plant diversity.

Perhaps the most well-known example of this crossroads of species lies in the Niobrara river valley in north-central Nebraska. Northern boreal species like paper birch meet the western icons of ponderosa pine and aspen, while bur oaks and boxelders represent the frontier of the eastern woodlands. Three types of prairie ecosystems can be found along the Niobrara; western shortgrass, eastern tallgrass, and mixed-grass Sandhills prairies. The Niobrara is a microcosm of the ecological diversity of the state.

Dozens of tree species reach the limits of their natural range in Nebraska. Birches and aspen reach no further south and east. Hickories, sycamores and most species of oak cannot be found any further north and west. Ponderosa and limber pines find their eastern limit here, and American elms and silver maples find their western limit.

Much of this diversity is driven by two climate-based factors: rainfall and temperature. While most native Nebraska trees tolerate being moved north into colder winters, there are several of the northern species that do not tolerate the increasing heat as they are moved south. These are mostly the boreal species; the spruces, aspen and birches.

Traditionally, the 100th meridian has served as the dividing line between the moist east and humid west. This is more than an arbitrary border— this line of longitude closely approximates the transition between areas that get more than 20” of annual rainfall, and those areas that receive less than 20” a year. This nicely divides the short-grass prairies of the west from the tall-grass and mixed-grass prairies of the east.

Another “isohyet,” or precipitation border, runs along the Missouri river at Nebraska’s eastern edge. When it comes to trees, this line is perhaps a better delineation between the east and west.

Progressing eastward from the Missouri river corridor, the average annual rainfall exceeds 30 inches, which supports eastern woodland species such as red oak, hickory, hophornbeam and redbud. Forests are generally out-competed by grasslands in areas with less than 30” of rain annually, and are mostly limited to cottonwoods, willows, ash and elm along rivers and streams. An exception to this rule is the eastern redcedar, which thrives in grasslands in the absence of fire.

It’s important to remember that most of these trees will still do very well if planted in a landscape outside their native range— especially if the seed was collected near the limit of that range.

If you’re looking forward to this summer’s vacation, consider taking a tour of several diverse ecosystems as you relax on a canoe or inner tube floating down the Niobrara. There is no better place to illustrate vividly the concept of Nebraska as a crossroads of plant species—and floating the river is a lot of fun regardless!