GEOLOGY

Physiographic Region

The Blue River watershed is located in the Central Lowland region (Figure nd) of Missouri. Subdivisions of the Central Lowland are the unglaciated Osage Plains and the glaciated Dissected Till Plains. Most of the Blue River watershed is in the Western glaciated Plains which is a subsection of the Dissected Till Plains (Missouri Department of Natural Resources [MDNR] 1986). Land surface elevations in the drainage vary from 1135 feet (m.s.l.) in the headwaters to 700 feet (m.s.l.) at the mouth (USACOE 1974).

Geology

The watershed is primarily loess and glacial till overlying deposits of limestone, shale and cyclical deposits of siltstone, sandstone, shale, limestone, clay and coal of Pennsylvanian age. Because of the geology and soil types (Figure ge) in the area, there are no notable springs. Most water movement in the watershed is through the surface stream network. Baseflow during dry periods is very low in the upper Blue River, but is sustained in Indian Creek by treated wastewater effluent.

Soil Types

The primary soil types along the Blue River are Kennebec silt loam, Colo silty clay loam and Bremer silt loam. Erodibility of these soils is moderate, while permeability and runoff are moderately slow. Soil types farther away from the stream include Menfro silt loam, Knox silt loam, and several soil types underlying urban land complexes. These soils contribute to very rapid runoff especially in heavily developed areas (U.S. Department of Agriculture Natural Resources Conservation Service [USDANRCS] 1984).

Stream Order

The Blue River is a fifth order stream which originates at the confluence of Wolf Creek (fifth order) and Coffee Creek (fourth order). The orders and lengths of major watershed streams are listed in Table 1. This information was determined using U.S. Geological Survey (USGS) 7.5 minute topographic maps.

Watershed Area

The watershed of the Blue River is 270 square miles (USACOE 1974). The largest sub-basin is the Indian Creek watershed which is 50 square miles. Watershed areas of basin streams fourth order and larger are listed in Table 2. These were calculated using USGS 7.5 minute topographic maps.

Channel Gradient

Average gradients range from 4 feet/mile for the Blue River to 68 feet/mile for Round Grove Creek. Stream gradient information was calculated using USGS 7.5 minute topographic maps.

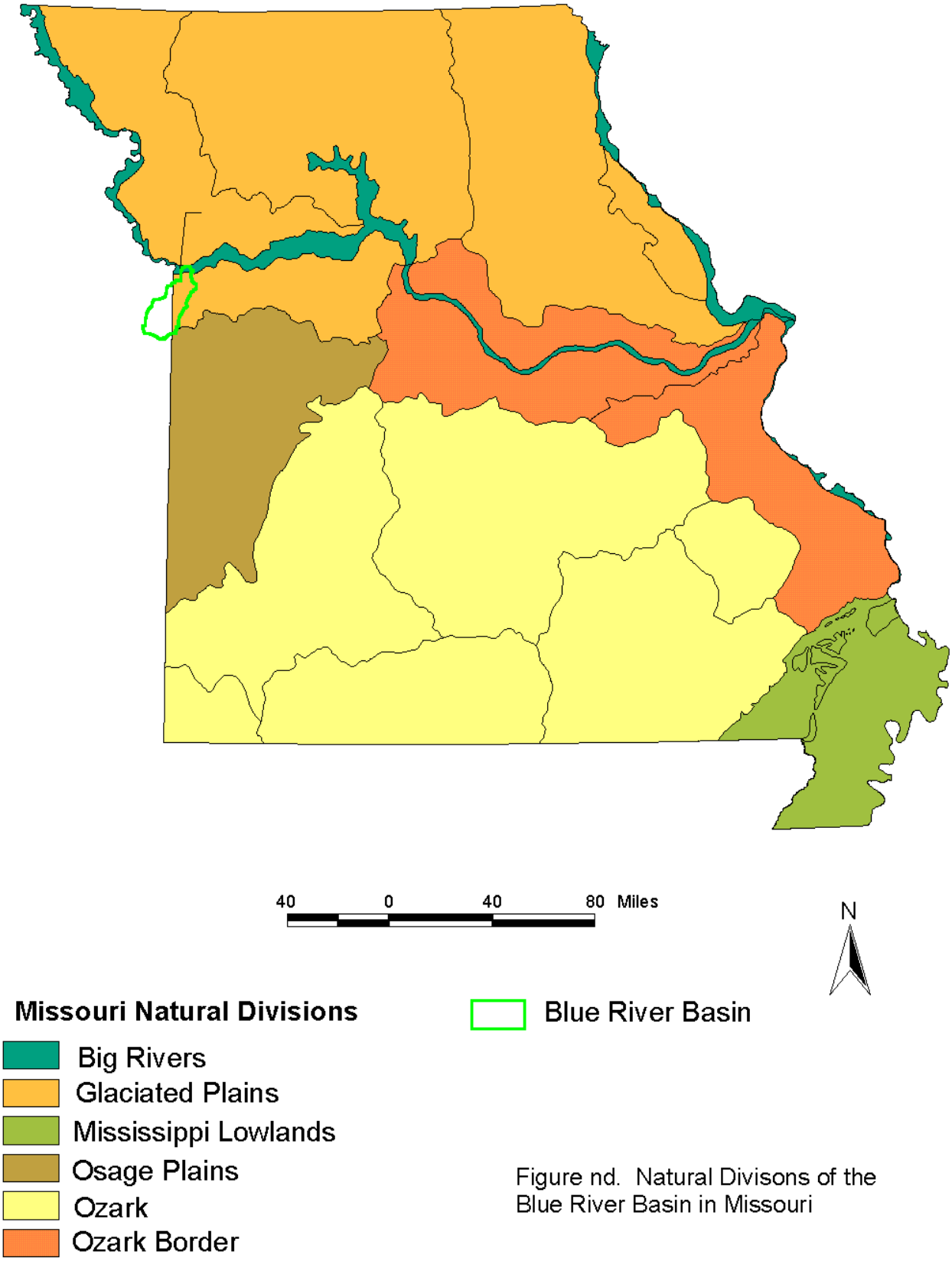

Figure nd. Natural Divisons of the Blue River Basin in Missouri

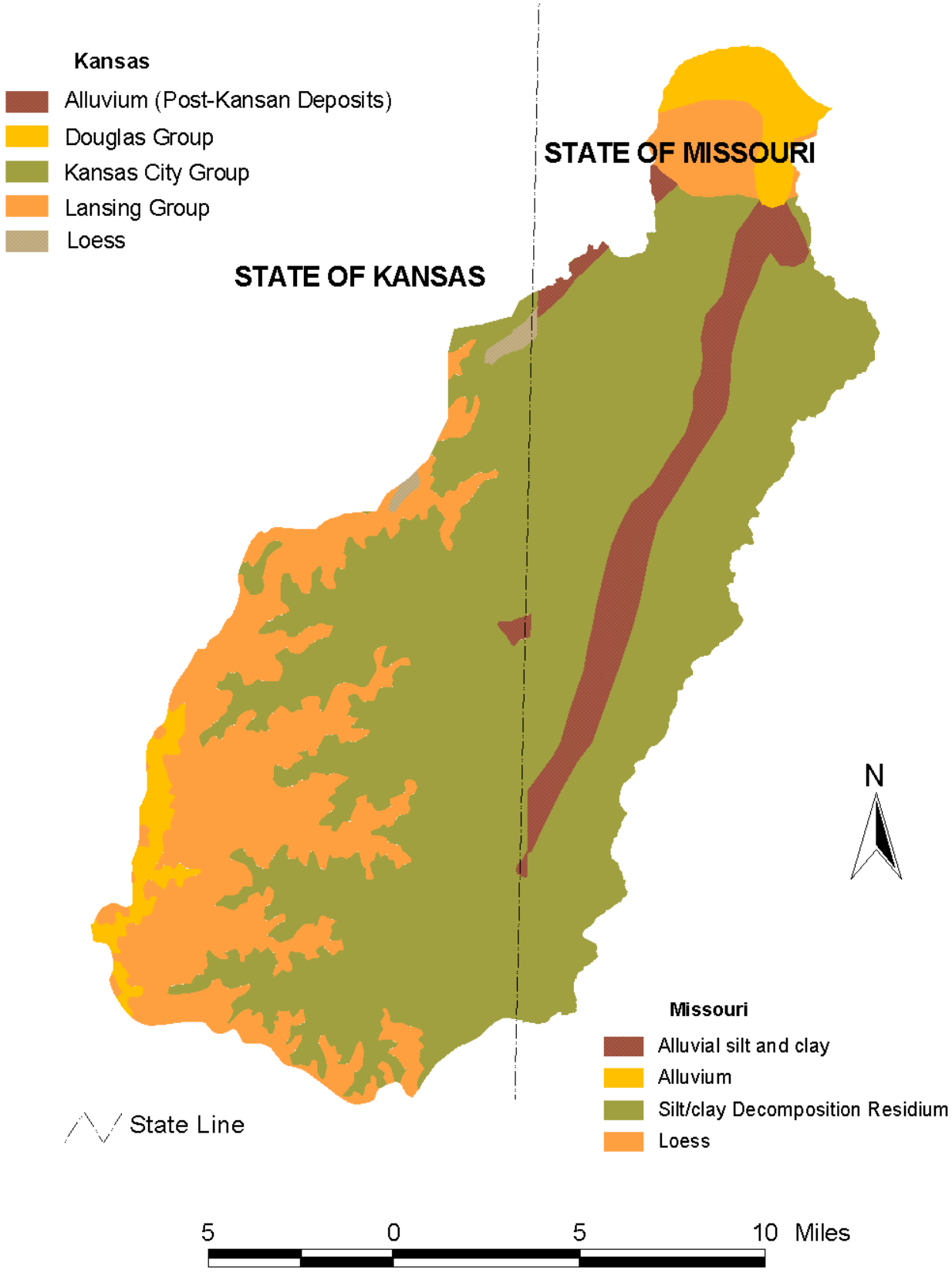

Figure ge. Geological divisions in the Blue River Basin, in Missouri and Kansas

Table 1. Orders and lengths of major streams located within the Blue River Basin.

Name	Order	Length (Miles)
Blue River	5	40.7
Wolf Creek	5	11.3
Indian Creek	4	23.5
Tomahawk Creek	4	11.8
Brush Creek	4	10.6
Coffee Creek	4	10.2
Camp Branch	4	7.1
Unnamed (KS)	4	4.9
Mill Creek	3	6.8
Negro Creek	3	6.7
Dyke Branch	3	4.8
Round Grove	3	4.3

Table 2. Watershed areas of major streams located within the Blue River basin.

Stream	Order	Watershed Area (Mi^2)
Blue River	5	270
Wolf Creek	5	29
Indian Creek	4	50
Brush Creek	4	30
Tomahawk Creek	4	23
Coffee Creek	4	16
Camp Branch	4	12
Unnamed (KS)	4	5