

to supply some of the rural systems in northcentral Jennings County.

Surface water is used widely in Jennings County and is also used to supply parts of Brown County, the city of Seymour, and the town of Westport. The surface water distributed in Brown County is withdrawn from Monroe Reservoir by way of the Bloomington municipal utility. Water from Ogle Lake in the Brown County State Park is being sold to the town of Nashville. Westport has a surface-water intake on Sand Creek, with two surface storage ponds within the city limits. Seymour withdraws water from the East Fork of White River, despite the fact that Seymour is located just east of the White River bottom aquifer.

The city of North Vernon primarily withdraws water from the Vernon Fork of the Muscatatuck River, supplemented by releases as necessary from the Brush Creek Reservoir. Brush Creek was built by the State of Indiana as a joint water supply for the Muscatatuck State School and the city of Vernon. This property is also used for fish and wildlife purposes, but it remains as the secondary supply for North Vernon. North Vernon, in turn, supplies Vernon and rural water systems in Jennings County.

Projections of public water supply withdrawals indicate that withdrawals by the region's public water supplies may increase to approximately 19.4 mgd by the year 2000, as indicated in the following table. This projection is based on the assumption that rural water systems will continue to expand their service areas.

Table 158

The 1977 and projected withdrawal and consumption rates for public water supplies by the year 2000, in million-gallons-per-day.

<i>Public Water Supply</i>	1977	1980	1990	2000
Withdrawal	12.3	13.1	16.2	19.4
Consumption	2.9	3.0	3.7	4.5

Industrial Water Industrial establishments had an estimated water intake averaging 12.0 mgd in 1977. Of the total industrial intake, 4.9 mgd was withdrawn by the industries themselves while 7.1 mgd was purchased from public utilities.

Ground water is the major source of industrial water supplies. A number of industries develop at least a part of their own water supply from company-owned well fields. Most of the industries relying on wells for significant quantities of water are confined between the communities of Edinburgh, Columbus, Seymour, and Brownstown along the East Fork of the White River.

The largest water-using industry groups include food processors and the manufacturers of transportation equipment. Other industries that use significant

amounts of water include manufacturers of rubber and plastic products, furniture, and primary metal products.

Industrial production for the year 2000 is expected to be 112 percent above the 1977 value (U.S. Water Resource Council). In spite of this predicted increase in industrial output, total industrial water intake is expected to decrease slightly to 11.8 mgd by 2000, due to increased plant efficiency. Of this total, approximately 5.0 mgd will be withdrawn directly by the industries. Industrial self-supplied withdrawals during 1977 and projections for future use are now presented.

Table 159

The 1977 and projected self-supplied withdrawal and consumption rates for industries, in million-gallons-per-day.

<i>Industrial Self-Supplied</i>	1977	1980	1990	2000
Withdrawal	4.9	4.8	4.8	5.0
Consumption	1.1	1.2	1.5	1.9

Rural Self-Supplied Water An estimated 69,100 persons lived in homes provided with some type of self-supplied water source in 1975. It is estimated that about 4.1 mgd was withdrawn for residential purposes in that year. By the year 2000, an estimated 79,700 residents will depend on their own supplies for household water. These people, along with the anticipated general rise in the standard of living, are expected to increase rural residential water use to approximately 6.2 mgd by the year 2000.

In 1975, there were an estimated 304,000 head of livestock and about 1,613,000 chickens. Collectively, these animals used about 2.0 mgd. By the year 2000, approximately 2.6 mgd may be required for these animals.

The total withdrawal of rural self-supplied water may increase from the current 6.3 mgd to approximately 8.8 mgd by the year 2000, as presented here.

Table 160

The 1977 and projected withdrawal and consumption rates for rural self-supplied water, in million-gallons-per-day.

<i>Rural Self-Supply</i>	1977	1980	1990	2000
Withdrawal	6.3	6.6	7.7	8.8
Consumption	6.3	6.6	7.7	8.8

Irrigation Water Soil associations with irrigation potential are located along the terraces of the East Fork of the White River or on the windblown sands along the rivers in Bartholomew and Jackson Counties. Figure 199 shows the potential irrigation areas within the region.

Based upon the survey of irrigated croplands, approximately 1,120 acres were irrigated in the region,

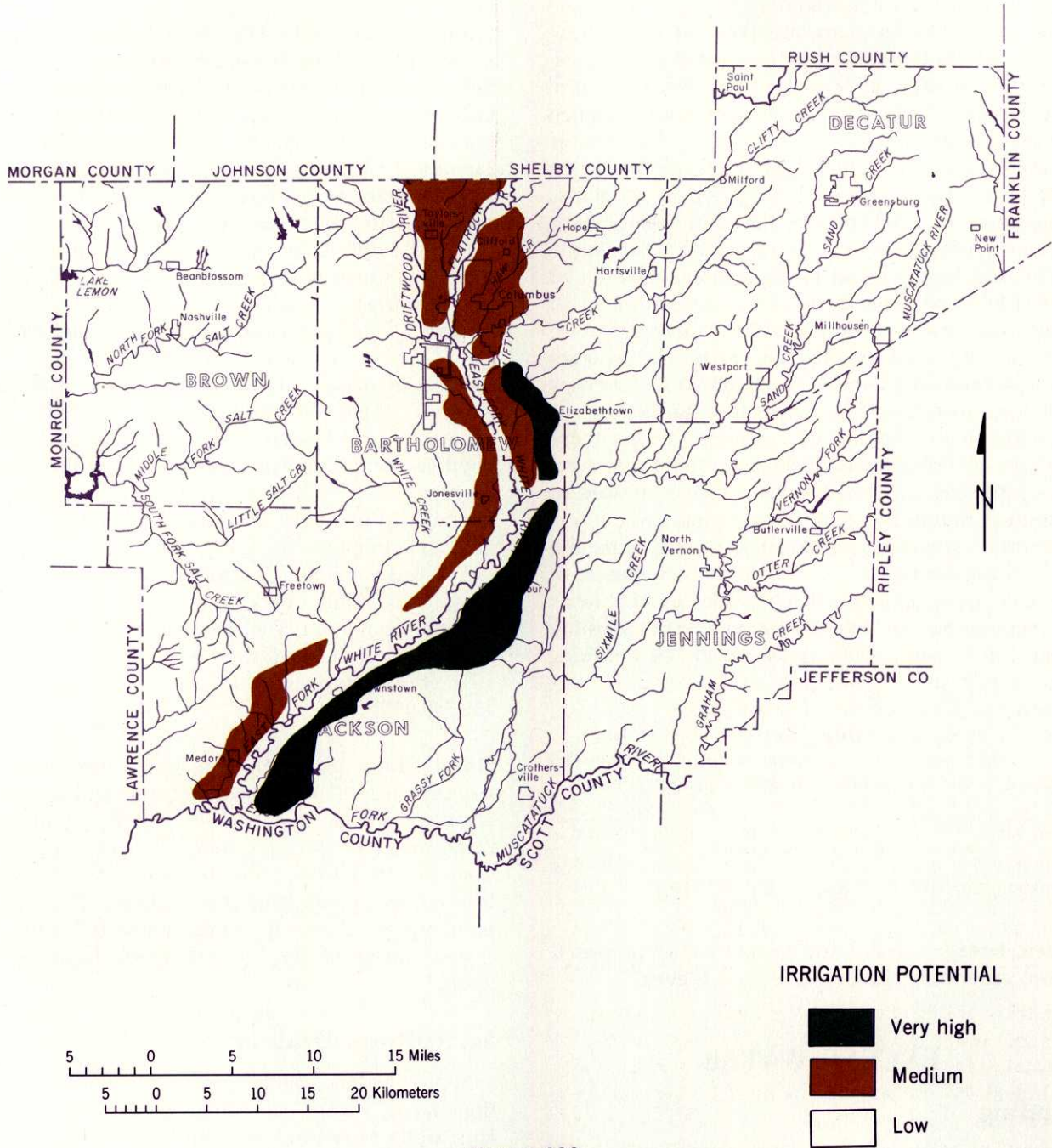


Figure 199
 Map of Region Eleven showing the location of the soil associations that appear to possess an economic potential for the irrigation of croplands.

1,100 acres in Bartholomew County and 20 acres in Jackson County. Crops irrigated include corn, soybeans, vegetables, and tobacco.

Assuming 1977 as a normal growing year, these crops required about 2.9 mgd during the peak irrigation period of July and August. About sixty percent of the water used in the region for irrigation was supplied from ground water.

It is estimated that about 23,000 acres in the region could be profitably irrigated. Irrigation of croplands may increase to 5,600 acres by the year 2000. This expansion of croplands may increase the peak July–August irrigation demand in an “average” season to about 14.7 mgd. The average season increase in ground-water withdrawals for crops is expected to increase to 12.1 mgd by the year 2000. The average season increase in ground-water withdrawals for crops is expected to reach 12.1 mgd by the year 2000.

In addition to irrigation for agricultural use, there are about 221 acres of irrigated fairways and greens on the region’s golf courses. About 0.7 mgd is applied to these areas during the peak July–August period.

The total withdrawal for irrigation of croplands and golf courses during the average irrigation season of 1977 was approximately 3.6 mgd. These withdrawals may increase to 15.6 mgd during an average growing season by the year 2000, as shown in the following table.

Table 161

The 1977 and projected withdrawal of irrigation water for croplands and golf courses, in million-gallons-per-day.

<i>Irrigation</i>	<i>1977</i>	<i>1980</i>	<i>1990</i>	<i>2000</i>
Withdrawal	3.6	5.1	10.4	15.6
Consumption	3.6	5.1	10.4	15.6

Electric Energy There are no existing or proposed electric generating stations in Region Eleven.

EXCESS WATER

Flooding

It is estimated that approximately 104,000 acres of the region are subject to flooding. The major flood plains are shown in Figure 200. Figure 201 delineates the average annual flood damages along selected streams within the region. The average annual damages due to flooding were estimated in 1977 to be \$6.5 million of which some eighty-two percent occurred in rural areas.

Virtually all of the streams are subject to flooding. Flash flooding on streams in the area is common due to the steepness of the topography. The East Fork of

the White River, the major waterway in the region, is subject to long flood durations.

Flood Control The U.S. Army Corps of Engineers, under the Flood Control Act of 1954, removed drift and debris from a section of the Muscatatuck River on the border between Jennings and Scott Counties near Tobias Bridge. The project was completed in 1968. In January, 1969, the project was transferred to the Jennings and Scott Counties Board of Commissioners for operation and maintenance.

Under authority of the 1948 Flood Control Act, the U.S. Army Corps of Engineers constructed channel improvement of a portion of Grassy Creek in Jackson County. The work consisted of cleaning and straightening 24,150 feet of the existing channel.

The U.S. Army Corps of Engineers is conducting a study to determine the economic feasibility, public acceptance, and advisability of providing additional flood protection improvements on the Driftwood, Flatrock, and East Fork of the White Rivers at and in the vicinity of Columbus. The study was initiated in 1975 and was completed in 1979.

The Federal Flood Control Act of 1965 authorized a reservoir on Clifty Creek for the purposes of flood control and recreation. The dam site is located 1.5 miles southwest of Hartsville in Bartholomew County. In 1976, the estimated total cost of the project was \$36,540,000.

Flood Plain Management Columbus, Jonesville, Greensburg, Brownstown, Crothersville, Medora, Seymour, and North Vernon as well as the unincorporated areas of Bartholomew, Decatur, and Jackson Counties are participating in the emergency phase of the National Flood Insurance Program. Nashville and unincorporated Brown County, are participating in the regular phase of the National Flood Insurance Program.

Agricultural Drainage

Approximately twenty percent of the soil associations have “severe,” seventeen percent have “moderate,” while sixty-three percent have “slight” wetness characteristics. Locations of the soil associations with these wetness characteristics are shown in Figure 202. There are approximately 270 miles of legal drains within the region.

Soil Erosion

The erosion potential of soil associations is shown in Figure 203. Thirty percent of the 1,274,800 acres within the region are rated as having a “high” potential erosion hazard. Twenty-four percent are rated as

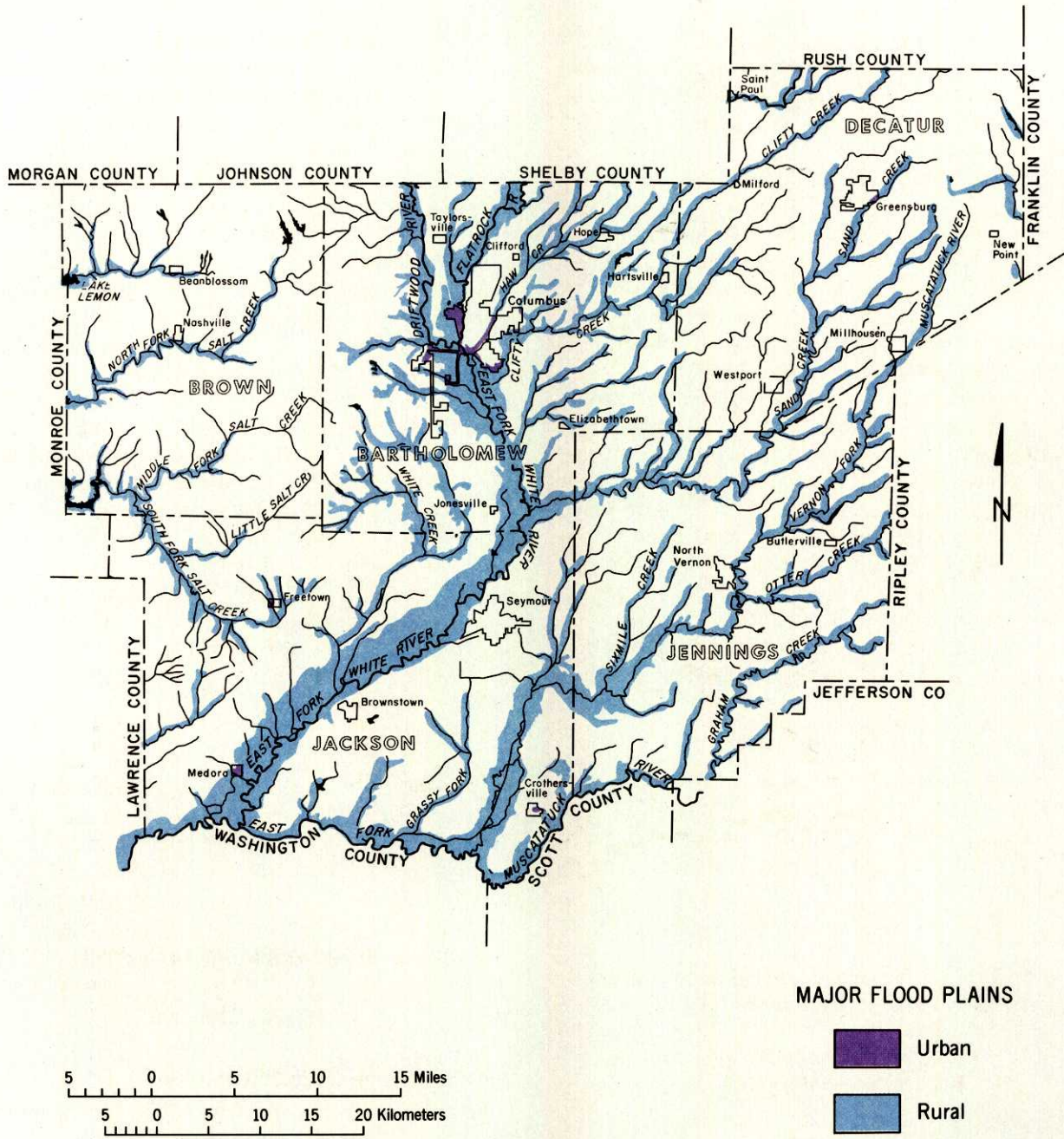


Figure 200
Map of Region Eleven showing the major flood plains.

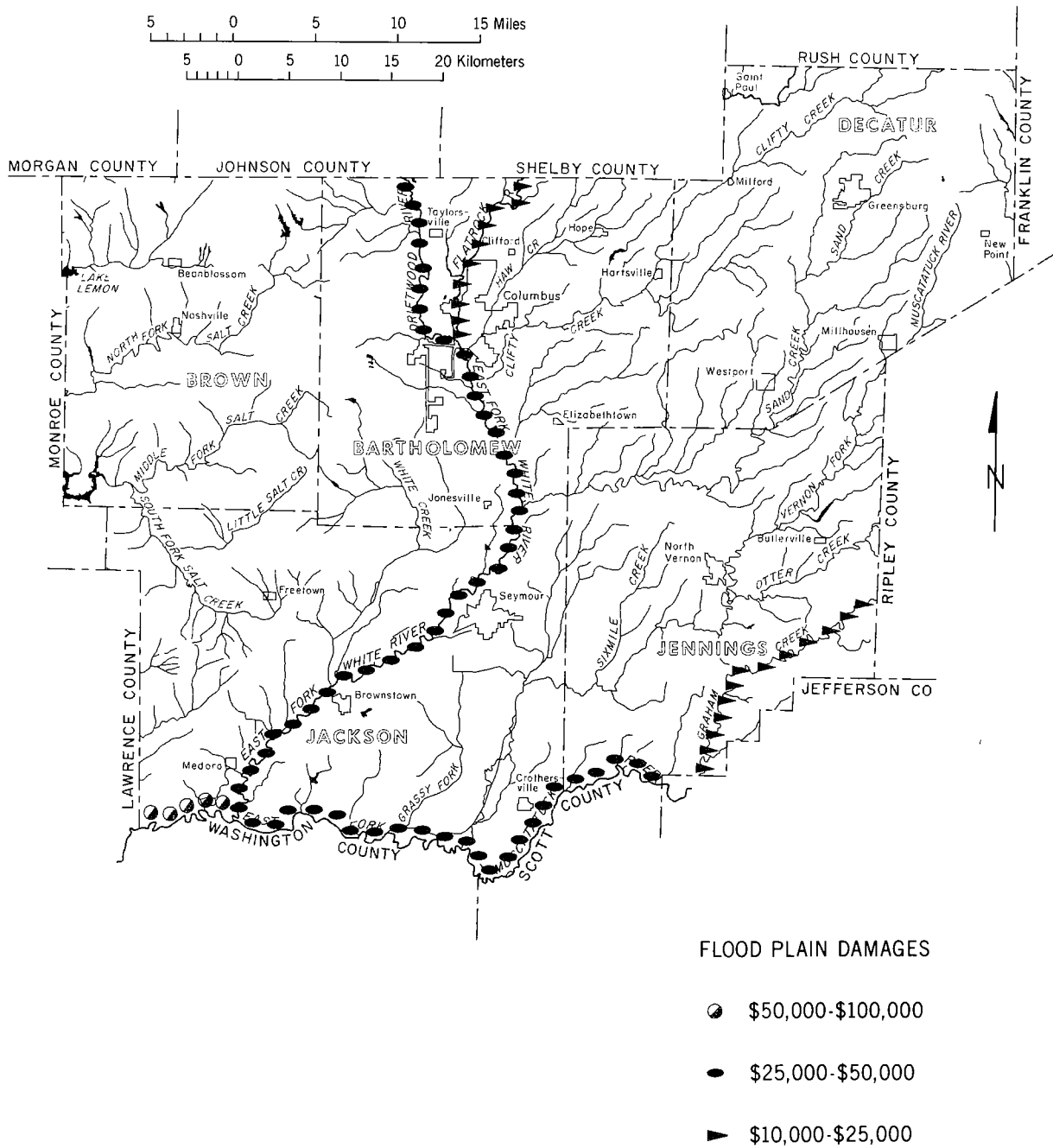


Figure 201
 Map of Region Eleven showing the estimated average annual flood damages per mile along selected streams.

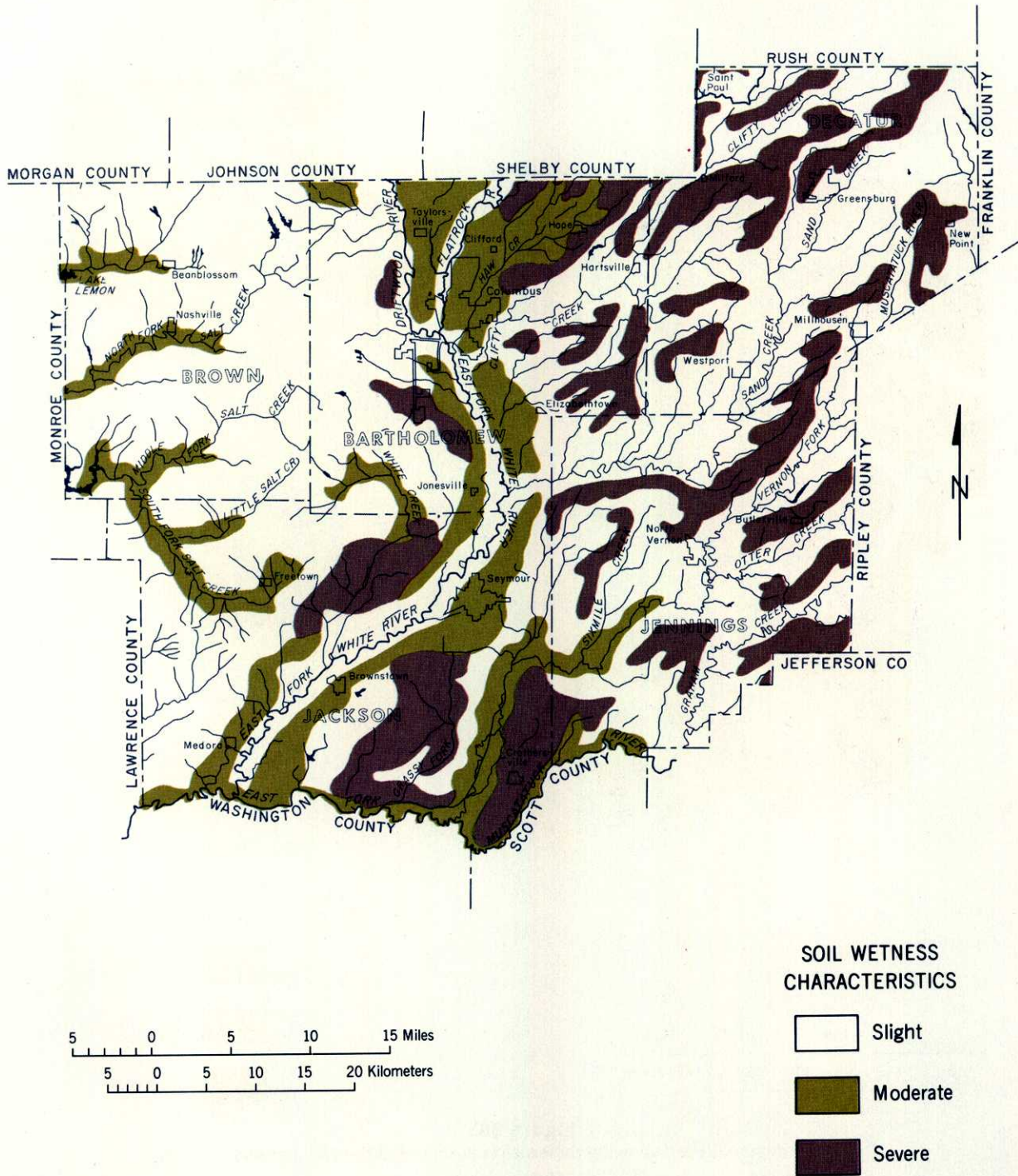


Figure 202
Map of Region Eleven showing the location of the wetness characteristics of soil associations.

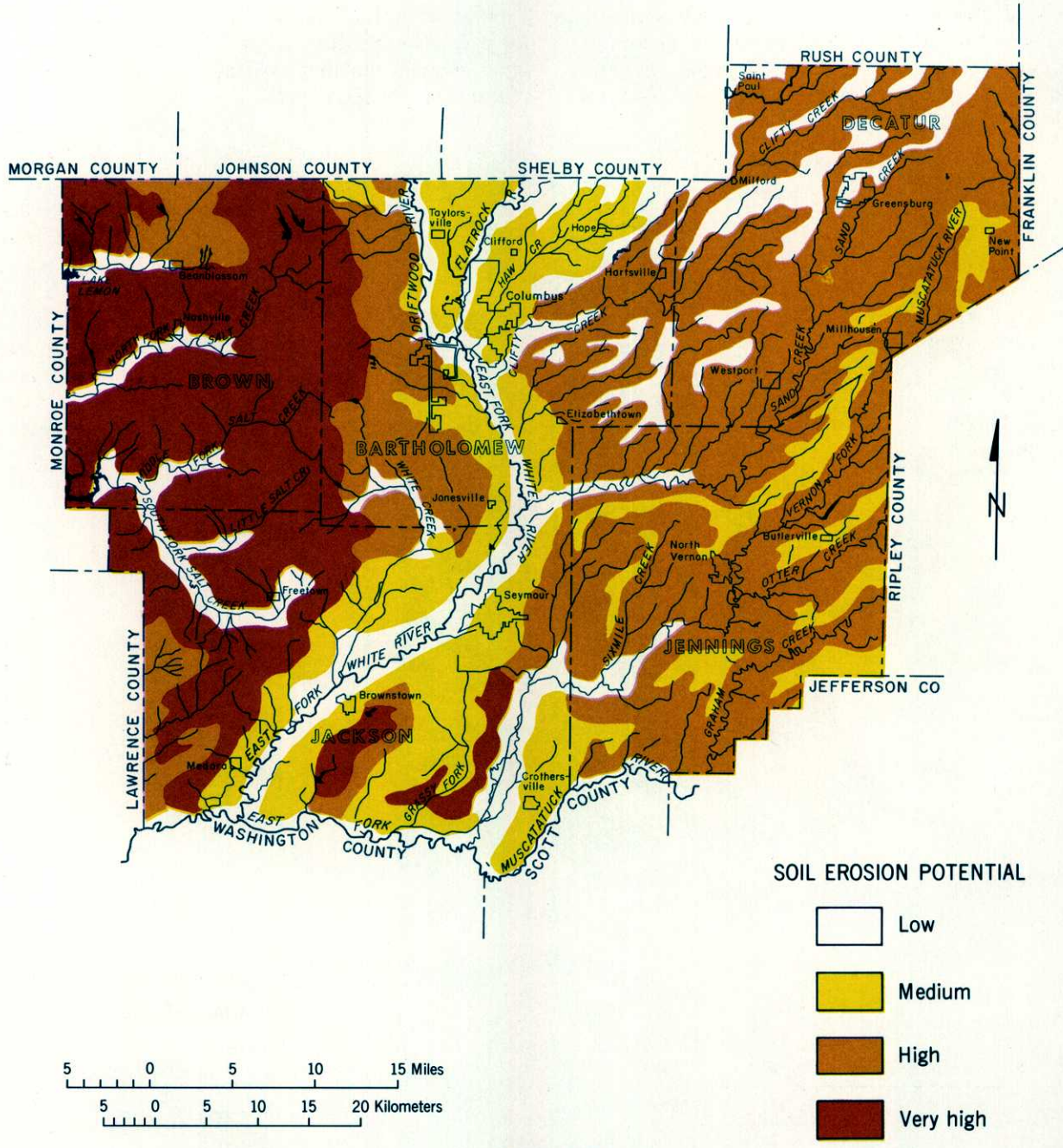


Figure 203
Map of Region Eleven showing the erosion potential of the soil associations.

having a "very high" potential. These are areas of relatively steep slope which require the protective cover of woodland and grassland if erosion is to be prevented. Twenty percent of the areas have a "medium" erosion hazard potential, while the remaining twenty-six percent have a "low" erosion potential for land left in a fallow state.

WATER QUALITY

The surface streams routinely surveyed for water quality by the Indiana State Board of Health are the East Fork of the White River, the Muscatatuck River, and Salt Creek. Water quality standards for the region are established by the Stream Pollution Control Board regulation SPC IR-4, the Water Quality Standards for the State of Indiana.

Water samples from the East Fork of the White River

indicated the dissolved oxygen and temperature levels met the state standards. However, concentrations of fecal coliform bacteria frequently violated the criteria for partial body contact. Total coliform bacteria levels near Seymour violated the standard set for a supply of raw drinking water.

A total of five fish kills within the region have been reported to the Indiana State Board of Health in the period 1974 to 1977. Two were in Brown County near Nashville and resulted from a discharge of inadequately treated sewage to Salt Creek and a sewage bypass to Salt Creek. An industrial discharge to Little Sand Creek in Bartholomew County resulted in a fish kill. The largest fish kill occurred in Decatur County near Greensburg and resulted from a sewage bypass to an unnamed stream. Only one fish kill of undetermined magnitude has been reported from Jennings County and was caused by misapplication of pesticide to an area near Six Mile Creek.