

Figure 255
Map of Region Fifteen showing the service areas of the public water utilities and average daily use in million-gallons-per-day.

withdrawn outside the county and region. Sellers and buyers are listed below. A few of the utilities are multi-county systems extending into two or more counties.

Table 208
Public water system sellers and purchasers.

<i>Sellers</i>	<i>Purchasers</i>
Dale Water Works	Santa LaHill, Inc.
English Municipal Water Works	Grantsburg Water Company Patoka Water Company
Ferdinand Municipal Water Works	St. Henry Water Corporation
Grandview	Finch Newton Water Corporation
Haysville Water Utility	Afordsville Water Works
Holland	Sendal Water Corporation ^a
Huntingburg Water Department	Birdseye Water System Duff Water Corporation St. Anthony Water Utilities St. Henry Water Corporation
Indiana Cities Water Corporation (French Lick—West Baden)	New Prospect Rural Water Company
Jasper Municipal Water Utility	Dubois Water Utilities, Inc. Ireland Utilities, Inc.
Leavenworth Water Company	Crawford County Water Corporation
Mitchell Water Department ^b	Orleans Water Works
Santa Claus Water Department	Santa LaHill, Inc.
Tell City Water Department	And-Tro, Inc. North Perry Water, Inc.
Tennyson Water Utility	Gentryville Water Utility

^aThis purchaser is located mostly outside the region.

^bThis seller is located outside the region.

Most public water systems in the region rely on surface water. Surface water is utilized by systems in the communities of English, Holland, Huntingburg, Ireland, Jasper, Ferdinand, French Lick, West Baden, Paoli, Chrisney, Dale, Santa Claus, and the newly formed Patoka Lake Regional Water and Sewer District. The Patoka Lake Regional Water and Sewer District will withdraw its supply from Patoka Lake to supply at least eleven of the region's existing utilities as well as certain rural areas. In addition, several systems in the region are undertaking expansions as a result of

development of the regional water and sewer district. Utilization of Patoka Lake as a water supply will allow the phasing out of several of the small water supply reservoirs.

The thirty-seven public water utilities in the region distributed an average of 6.5 mgd in 1975. Approximately sixty-one percent was derived from surface sources, while thirty-nine percent was withdrawn from ground-water sources. Projections of public water utilities indicate that withdrawals may increase to approximately 10.3 mgd by the year 2000, as indicated here.

Table 209

The 1977 and projected water withdrawal and consumption rates of public water supplies, in million-gallons-per-day.

<i>Public Water Supply</i>	1977	1980	1990	2000
Withdrawal	6.5	6.9	8.5	10.3
Consumption	1.1	1.2	1.4	1.8

Industrial Water Industrial establishments had an estimated water intake averaging 9.7 mgd in 1977. Of the total industrial intake 4.7 mgd was self-supplied by the industries themselves while 5.0 mgd was purchased from public water utilities. About 1.8 mgd was consumed through the manufacturing process. Most of the self-supplied water is withdrawn from ground-water sources.

The largest water-using industry group is comprised of small industries. Other industries that use large amounts of water include food processors and furniture manufacturers.

Industrial production is expected to increase by the year 2000. Total industrial water intake is expected to increase from 9.7 mgd to 11.5 mgd. Industrial self-supplied water withdrawals may increase to 6.0 mgd, as presented in the following table.

Table 210

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

<i>Industrial Self-Supply</i>	1977	1980	1990	2000
Withdrawal	4.7	4.7	5.3	6.0
Consumption	.9	1.0	1.4	1.9

Rural Self-Supplied Water Rural self-supplied water is withdrawn from wells, cisterns (particularly in Perry County), ponds, streams, springs, and water haulers. Ground-water withdrawals are generally limited to the smaller valleys.

An estimated 39,800 persons lived in homes supplied by individual water sources in 1975. It is estimated that 2.4 mgd was used for residential pur-

poses. The number of people depending on their own water supplies may decrease by the year 2000, due to the expansion of rural water systems. The anticipated general increase in the standard of living, however, may increase rural self-supplied water withdrawals for residential purposes to 2.6 mgd by the year 2000.

In 1975, rural water use for animals accounted for approximately 2.8 mgd. By the year 2000, this figure may increase to 3.3 mgd. Water for animals is generally supplied from ponds, streams, and springs.

The total withdrawal of rural, self-supplied water may increase from the current 5.0 mgd to approximately 5.9 mgd by the year 2000, as shown here.

Table 211

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

<i>Rural Self-Supply</i>	<i>1977</i>	<i>1980</i>	<i>1990</i>	<i>2000</i>
Withdrawal	5.0	5.1	5.5	5.9
Consumption	5.0	5.1	5.5	5.9

Irrigation Water Based upon the survey of irrigated lands, approximately 120 acres, all in Dubois County, were irrigated. Assuming 1977 as a normal growing year, approximately 0.3 mgd was applied during the peak irrigation period of July and August. In addition to the irrigation for agricultural use, golf courses are irrigated. About 0.5 mgd is applied to golf courses during the peak July and August irrigation period.

Because of the lack of soil associations which can be profitably irrigated the amount of water withdrawn for croplands and golf courses is expected to remain constant at 0.8 mgd as presented below.

Table 212

The current and projected withdrawal of irrigation water for croplands and golf courses during an average growing season, in million-gallons-per-day.

<i>Irrigation</i>	<i>1977</i>	<i>1980</i>	<i>1990</i>	<i>2000</i>
Withdrawal	0.8	0.8	0.8	0.8
Consumption	0.8	0.8	0.8	0.8

Electric Energy Region Fifteen contains one electric generating facility, the Jasper plant, which utilizes a cooling system that requires approximately 0.2 mgd. This water is withdrawn from an impoundment on the Patoka River. Water returned to the river after the cooling process approaches 0.05 mgd. This facility is rated at 14.5 megawatts.

The Indiana and Michigan Electric Company has announced plans to construct a power plant along the Ohio River near Rockport in Spencer County. This plant is designed to have a generating capacity of 2,600 megawatts and is expected to consume 32.0 mgd

of water from the Ohio River. The facility may become operational in the 1980s. Water withdrawals for the generation of electricity are expected to increase to 65.2 mgd by the year 2000, as presented in Table 213.

In addition to these facilities, there are several existing and proposed generating stations on the Ohio River both upstream and downstream from Region Fifteen.

Table 213

The 1977 and projected water withdrawal and consumption rates for the production of energy, in million-gallons-per-day.

<i>Energy</i>	<i>1977</i>	<i>1980</i>	<i>1990</i>	<i>2000</i>
Withdrawal	0.2	0.2	65.2	65.2
Consumption	0.2	0.1	32.4	32.4

EXCESS WATER

Flooding

Approximately 83,300 acres are subject to flooding. The major flood plains are shown in Figure 256. Figure 257 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 approximately \$737,200 in urban areas and \$4,233,900 in rural areas. Losses in the Lost River watershed in Orange County account for thirty-six percent of the region's urban damages and thirteen percent of the rural damages. Approximately twenty-eight percent of the region's urban damages and thirty-one percent of the rural damages occur in the Patoka River watershed. Less than one percent of the flood damages occur along the Ohio River.

Flood Control The small watershed projects that are completed include French Lick and Middle Fork of the Anderson River. A small watershed project for the Anderson River has been approved for construction.

The U.S. Army Corps of Engineers has completed two local protection projects in the region. Both are in Perry County at Tell City and Cannelton.

The Tell City project is located along the Ohio River at Tell City, and consists of a system of earth levees and a concrete wall with pumping facilities to dispose of sewage and drainage from the protected area during floods. The project protects an area of about 200 acres from a flood equal in magnitude to the 1937 flood, the maximum flood of record for that area. Since its completion in 1943, it is estimated that this project has averted flood damages at Tell City in an amount of about \$8,085,000.

The Cannelton Local Protection Project, which was completed in 1952, consists of a system of earth levees

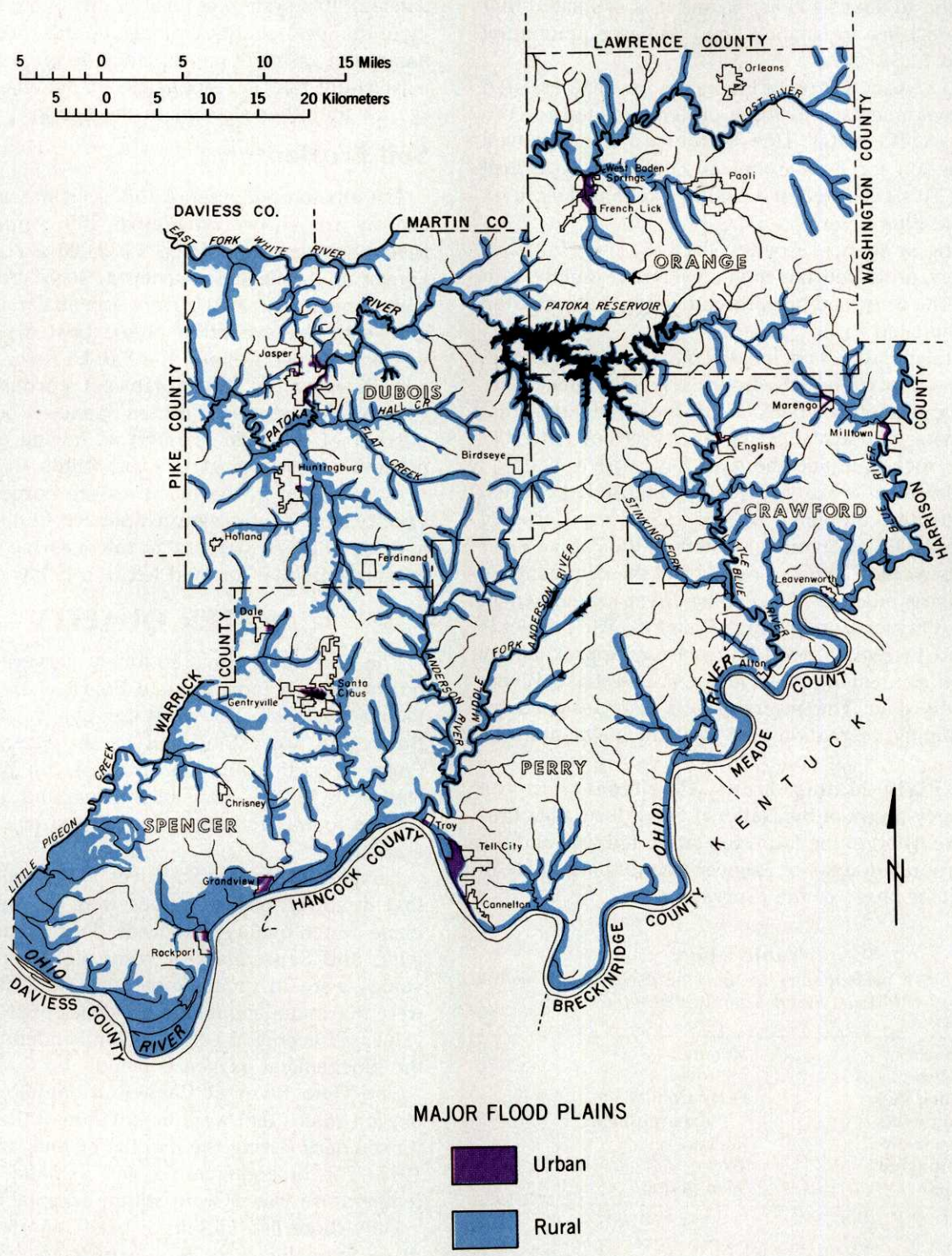


Figure 256
 Map of Region Fifteen showing the major flood plains.

and concrete walls with pumping facilities. It provides protection to about 400 acres, and it is estimated that this project has forestalled flood damages amounting to about \$1,840,000.

The U.S. Army Corps of Engineers has also assisted local governments with three projects related to control of excess water. One of the projects involved construction for flood relief at English in Crawford County. This consisted of 3.4 miles of channel work on the Little Blue River.

At Troy in Spencer County, the U.S. Army Corps of Engineers protected the municipal water supply with riprap. The wells had been threatened by bank erosion along the Ohio River.

The third project is located at Rockport, also in Spencer County. The U.S. Army Corps of Engineers repaired a segment of bank along the Ohio River that was caving and endangering a city street lying between a rock bluff and the river.

Flood control is also provided by Patoka Lake which was recently completed by the U.S. Army Corps of Engineers. The reservoir is located on the Patoka River near Ellsworth in Dubois County, and the dam controls 168 square miles of the Patoka River watershed in Dubois, Crawford, and Orange Counties. The project is designed to reduce flood damages by approximately fourteen percent on the Patoka and Wabash Rivers below the dam. The reservoir was also designed for water supply, recreation, and low-flow augmentation.

Flood Plain Management Participants in the emergency phase of the National Flood Insurance Program are listed in the following table. Tell City and the unincorporated areas of Spencer County participate in the regular phase of the program.

Table 214

Communities participating in the emergency phase of the National Flood Insurance Program.

Cannelton	Marengo
English	Milltown
French Lick	Perry County,
Gentryville	unincorporated
Grandview	Rockport
Huntingburg	Troy
Jasper	West Baden

Agricultural Drainage

Approximately three percent of the soil associations have "severe," eighteen percent have "moderate," while seventy-nine percent have "slight" wetness characteristics as shown in Figure 258.

There are approximately sixty miles of legal drains in the region which serve as the main collectors and

outlets for on-farm drainage systems. The maintenance of this system of legal drains is the responsibility of the local county drainage boards, or in a limited number of cases, of conservancy districts. There is no legal entity that is responsible for maintaining drainage for the other streams in the region.

Soil Erosion

The erosion potential of soil associations within the region are shown in Figure 259. Approximately seventy-six percent of the 1,235,000 acres in Region Fifteen is classified as having a "high" potential erosion hazard. This area covers essentially all of the region with the exception of the Lost River valley in western Orange County, the Patoka River and Anderson River valley, the northwest corner of Dubois County, and extreme southern Spencer County. Eleven percent of the land is rated as having a "medium" potential erosion hazard. Land within this classification is located in the northwestern corner of Dubois County and southwestern Spencer County. The remaining thirteen percent is rated as having 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 Patoka and Ohio Rivers. 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, and SPC-3, which applies to wastes and drainage from coal mining operations.

Samples of the Patoka River near Jasper indicated that dissolved oxygen values were in violation of Indiana water quality standards during June, July, August, and September of some years. Temperature values were in compliance with state standards, as were maximum and minimum values of pH. The nitrate values all averaged below recommended levels as did the biochemical oxygen demand.

The Ohio River at Cannelton exhibited dissolved oxygen values that were in violation of the water quality standard during the months of June and August in 1977. The biochemical oxygen demand, nitrate and temperature values were within acceptable levels.

Only three fish kills have been reported to the Indiana State Board of Health from the region in the period 1974 to 1977, and all were in Orange County. One occurred in Lick Creek near Paoli and resulted in approximately one hundred fish killed from an industrial spill. The other two occurred near French Lick, one from hog waste discharge into Sulphur Creek which killed ten fish, and another from a sewer bypass into French Lick Creek which killed 1,230 fish.

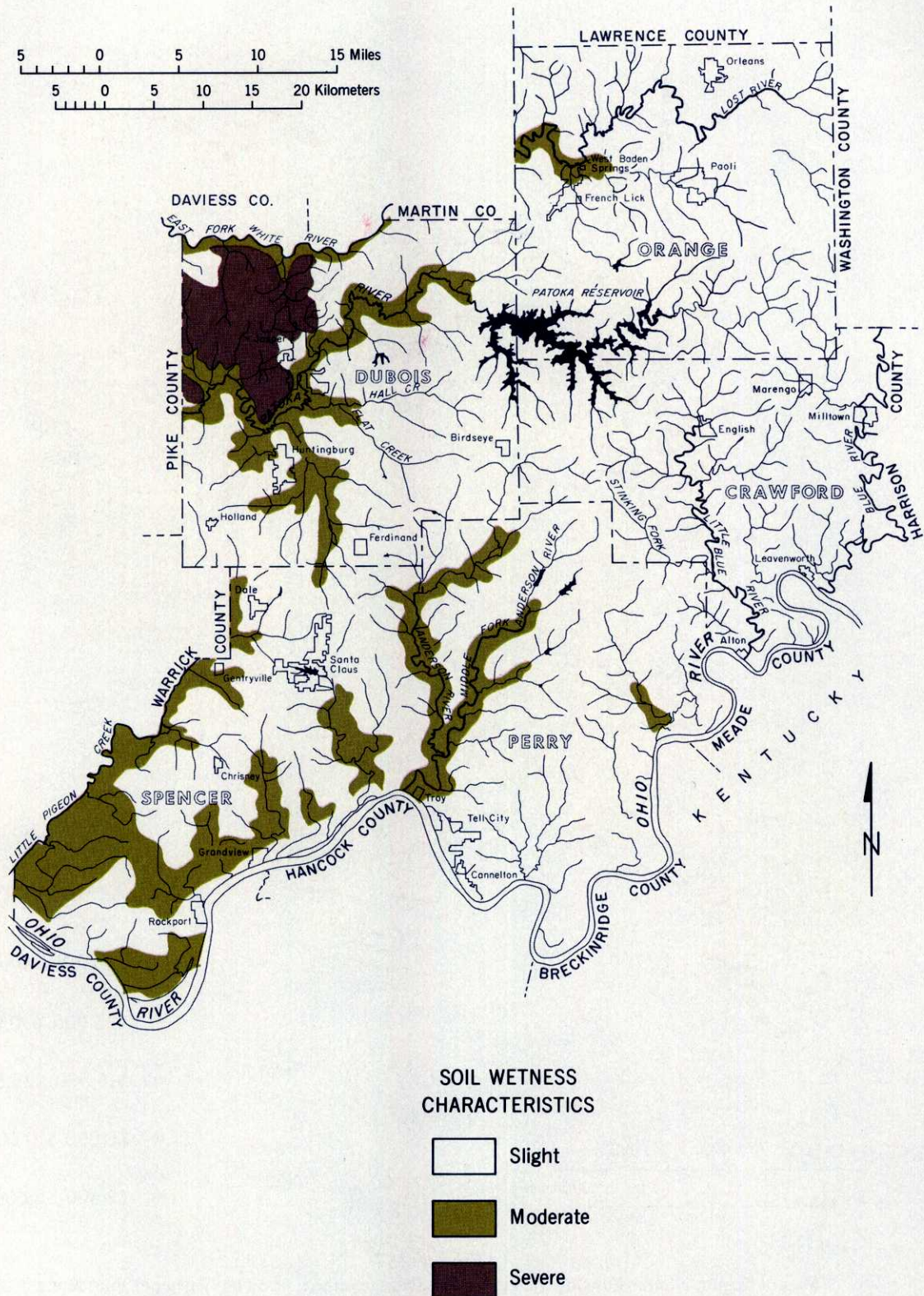
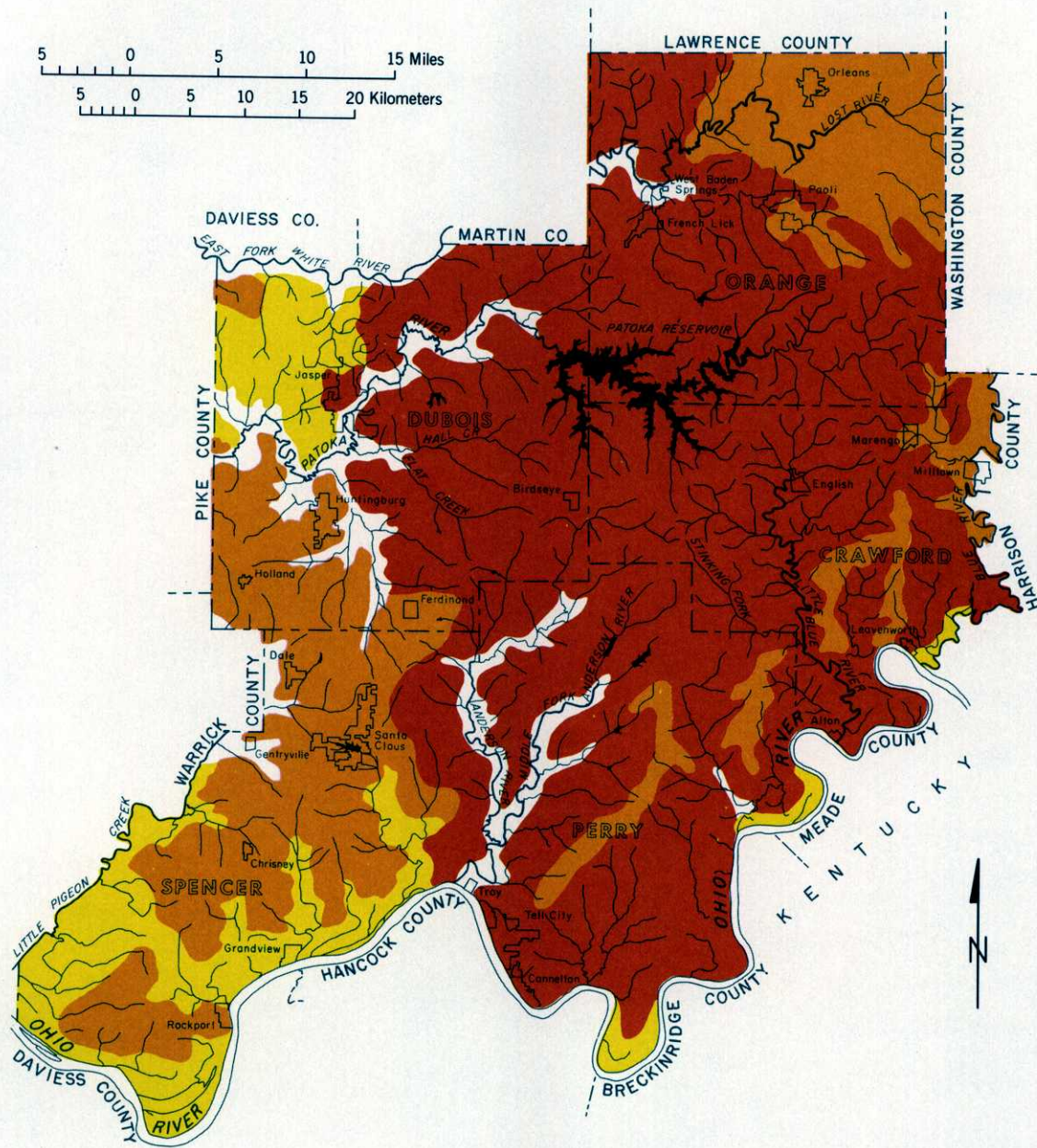


Figure 258
 Map of Region Fifteen showing the general location of the wetness characteristics of soil associations.



SOIL EROSION POTENTIAL

- Low
- Medium
- High
- Very high

Figure 259
Map of Region Fifteen showing the erosion potential of the soil associations.