



Region Fifteen



Crawford, Dubois, Orange, Perry, and Spencer Counties, located in south-central Indiana, form Region Fifteen. The region encompasses approximately 1,930 square miles and is bounded by Daviess, Martin, and Lawrence Counties to the north; Washington and Harrison Counties to the east; the Ohio River to the south; and Warrick and Pike Counties to the west as indicated in Figure 250.

The 1975 population was approximately 95,000 of which thirty-four percent resided in Dubois County. The official Indiana Population Projections indicate the region's population will increase by nineteen percent by the year 2000. The 1975 population and the projections for each county are presented below. The major population centers within the region are Jasper in Dubois County and Tell City in Perry County.

Table 203

The 1975 and projected populations for Region Fifteen.

County	1975	1980	1990	2000
Crawford	8,700	9,400	10,300	11,100
Dubois	32,000	33,300	36,500	39,500
Orange	17,400	17,900	18,600	18,900
Perry	19,100	19,200	19,700	20,200
Spencer	17,800	18,700	20,600	22,600
Total	95,000	98,500	105,700	112,300

Agriculture is the dominant land use within the region with more than fifty-one percent of the area devoted to that purpose. Approximately thirty-seven percent of the land is forested while the remaining twelve percent represents urban and miscellaneous uses. The

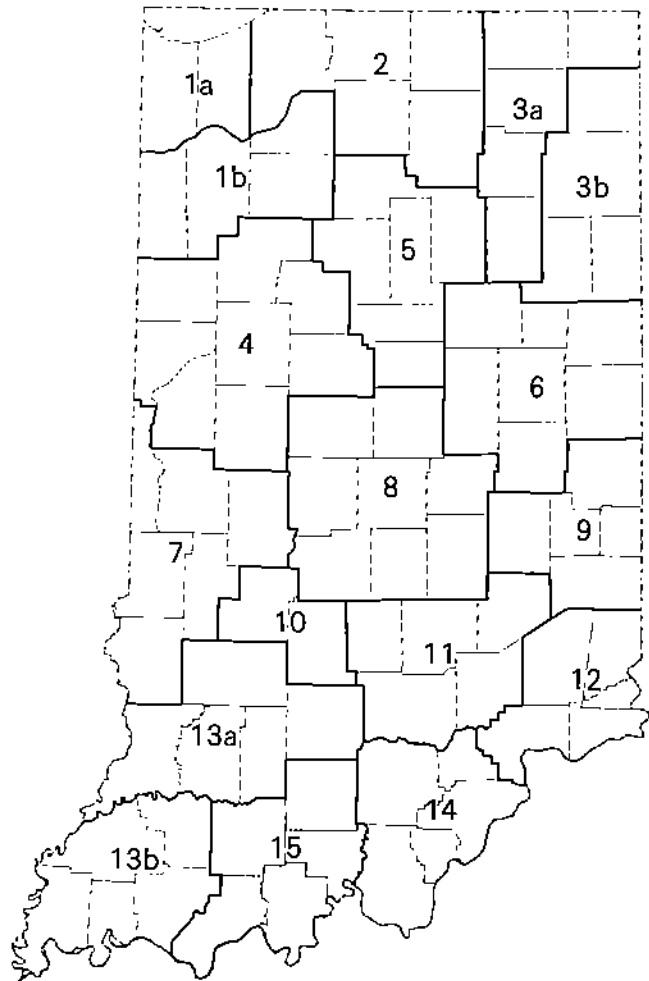


Figure 250
Map of Indiana showing the location of Region Fifteen.

topography of the region is characterized by slightly rolling to hilly terrain.

Approximately fifty-two percent of the work force is employed by the manufacturing sector with the lumber and furniture industries providing a large percentage of the jobs. The nonmanufacturing sector provides about forty-two percent of employment opportunities with wholesale and retail trade leading this sector. Over half of the employment opportunities are in Dubois County.

Average annual precipitation for the region is approximately 45.0 inches. This varies from a high in March of 4.7 inches to a low in October of 2.5 inches. Of the 45.0 inches of average annual precipitation approximately 27.0 inches are consumed through evapotranspiration while 18.0 inches appear as streamflow. Average temperatures range from 33°F. in January to 77°F. in July. The average annual temperature is 56°F. Prevailing winds are from the south to southwest at 8.3 miles per hour.

THE WATER RESOURCE

Ground Water

Ground-water availability is usually considered poor except for sand and gravel deposits along the Ohio River and a few isolated areas in western Dubois and southwestern Spencer Counties, as shown in Figure 251.

Bedrock is usually shallow in depth with layers of thin, weathered and broken rock overlying it. The bedrock consists of shales, sandstones, and limestones which yield limited amounts of water. Wells in these bedrock deposits normally yield less than ten gallons-per-minute (gpm). Higher yields up to one hundred gpm are possible from limestones in northeastern Orange County. Areas bordering Crawford County along the Blue River can also be expected to

produce above average well yields from bedrock sources.

Large ground-water yields in the region are only available along the Ohio River and the East Fork of the White River where thick sand and gravel deposits are present. Properly constructed, large-diameter wells can be expected to produce over 1,000 gpm from these deposits. Other areas of higher ground-water yields are limited to western Dubois County, where sand and gravel deposits are capable of producing up to two hundred gpm, and to southwestern Spencer County, where deposits contained in an old Ohio River channel can yield up to six hundred gpm.

Water hardness varies considerably with maximum values of 700 parts-per-million (ppm) occurring in eastern Orange and Crawford Counties. The limestones also exhibit lower than normal values of iron at 2.0 ppm, higher than normal nitrates at 5.0 ppm, fluoride at 1.7 ppm and sulfate levels above 500 ppm.

Wells in sand and gravel deposits along the Ohio River yield fairly hard water of 320 to 550 ppm, iron as much as 5.4 ppm, and high sulfates and nitrates ranging from 3.0 to 4.0 ppm.

Surface Water

Streamflow Region Fifteen is bordered on the south by the westward flowing Ohio River, on the north by the westward flowing East Fork of the White River, on the east by the southward flowing Blue River, and on the west by southward flowing Little Pigeon Creek. Drainage within the region is affected primarily by the Anderson, Patoka, Lost, and Little Blue Rivers and their tributaries. Generally, the streams flowing westward are part of the Wabash River basin, and the southward flowing streams enter directly into the Ohio River.

The seven day, once in ten year (Q7-10), one day, once in thirty year (Q1-30) and the average annual flow in million-gallons-per-day (mgd) for streams with gaging stations within Region 15 are tabulated below.

Table 204
Flow characteristics of streams.

Stream	Drainage Area (square miles)	Million-Gallons-Per-Day		
		Average Annual	Q7-10	Q1-30
Lost River near West Baden Springs ^a	287	na	1.7	na
Middle Fork Anderson River at Bristow	42	34	0.0	0.0
Patoka River near Ellsworth	171	130	0.1	0.0
Patoka River at Jasper ^b	262	230	0.5	0.0

na: not available.

^aFlow characteristics estimated from stream gaging stations with a short period of record.

^bFlow recorded prior to the construction of Patoka Lake.

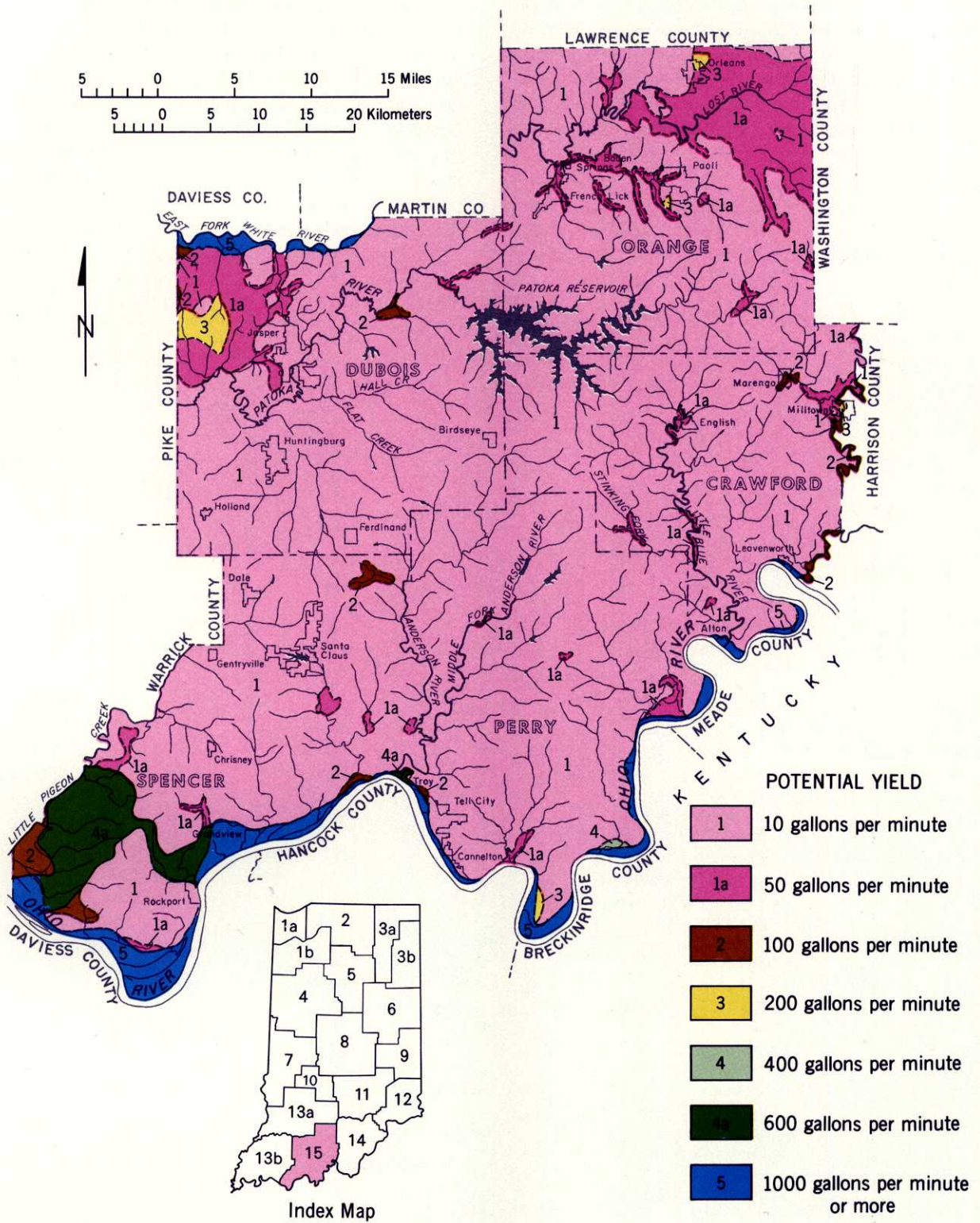


Figure 251
Map of Region Fifteen showing the general location and potential yield of ground water from properly constructed large diameter wells.

The Ohio River bordering Region Fifteen has an average flow of 73,400 mgd, as measured at Louisville, Kentucky. Other than the Ohio River the Patoka River at Jasper has the most reliable streamflow because its zero flows occur the most infrequently. This stream has a flow of 1.6 mgd ninety percent of the time. Ground-water contribution to streamflow is minimal in the region as indicated by the frequency of zero low flows.

Lakes The lakes within the region that are at least 50.0 acres in size or have a storage capacity of 32.5 million gallons or more are listed in Table 205 and are

located on Figure 252. These thirty-seven lakes have a combined surface area of approximately 11,500 acres and a gross storage capacity in excess of sixty-seven billion gallons.

The soon-to-be functional Patoka Reservoir is located on the Patoka River in Crawford, Dubois, and Orange Counties. This joint state-federal facility was designed for flood control, water supply, water quality control, recreation, and fish and wildlife. The reservoir has a water supply pool surface area of 8,880 acres and a gross storage of 58,829 million gallons; of which sixty-three mgd have been allocated as a water supply.

Table 205

Lakes at least 50.0 acres in size or with a storage capacity of 32.5 million gallons or more.

<i>Lake Number</i>	<i>Lake Name</i>	<i>Drainage Area (square miles)</i>	<i>Surface Area (acres)</i>	<i>Gross Storage (million gallons)</i>
1	Beaver Creek Lake	3.87	190.0	772
2	Calumet Lake	na	9.0	32
3	City Lake	1.84	180.0	651
4	Ferdinand Old Lake	na	na	65
5	Ferdinand Reservoir	0.50	10.5	36
6	Ferdinand State Forest Lake	na	24.0	312
7	Holland Lake	0.57	23.5	58
8	Huntingburg Conservation Club Lake	na	na	na
9	Izaak Walton Lakes	na	na	91
10	Lottes Lakes	na	na	39
11	Olinger Lake	0.56	59.0	84
12	Patoka Lake	168.00	8,880.0	58,829
13	Ruxer Lake		37.0	114
14	St. Anthony Conservation Lake	na	10.0	65
15	Schneilville Conservation Lake	na	na	65
16	Buzzard Creek Structure No. F-3	na	na	109
17	French Lick Creek Structure No. F-7	6.98	141.0	549
18	English Reservoir	1.90	33.0	160
19	Wyandotte Lake	na	12.0	39
20	Christmas Lake	2.47	200.0	716
21	Dale Reservoir	0.40	20.0	32
22	Fishers Cedar Crest Lake	na	10.0	71
23	Lake Holly		14.5	39
24	Lincoln Park Lake	na	58.0	169
25	Noel Lake	0.27	20.0	59
26	St. Meinrad North Lake	na	9.0	65
27	St. Meinrad South Lake	na	5.0	45
28	Santa Claus Lake	na	10.0	40
29	Celina Lake	na	na	1,258
30	Indian Lake	na	na	556
31	Little Sulphur Creek Structure No. 2	na	na	179
32	Middle Fork Structure No. 7	11.80	39.0	32

Table 205 (continued)

Lake Number	Lake Name	Drainage Area (square miles)	Surface Area (acres)	Gross Storage (million gallons)
33	Mill Lake	7.18	39.6	35
34	Russell Byrds Echo Lake	0.80	11.0	43
35	Saddle Lake	3.53	40.8	159
36	Salinda Lake	na	na	1,171
37	Tipsaw Lake	9,000.00	1,420.00	593

na: not available.

UTILIZATION OF THE WATER RESOURCE

Instream Uses

The supply and demand analysis for recreational uses of water by residents of the region are presented

in Table 206. The existing supply for recreational activity is expressed as a percentage of the demand. Therefore, when this percentage exceeds one hundred the supply exceeds the demand. Conversely, when the supply is less than one hundred the supply is less than the projected demand.

Table 206
Outdoor recreation demand and supply analysis.

Activity	Percent of Population Participating	Density Guidelines	Approximate Supply	Existing Supply as a Percentage of Projected Demand		
				1980	1990	2000
Boating	29	19.6 boats/acre/year	12,600 acres ^a	100+	100+	100+
Waterskiing	10	34.4 skiers/acre/year	10,400 acres ^b	100+	100+	100+
Canoeing	6	585 canoes/mile/year	47 miles	100+	100+	100+
Swimming	41	76,600 swimmers/acre/year	12 acres ^c	100+	100+	100+
Ice-Skating	5	6,678 skaters/acre/year	1 acre	25	25	25
Fishing	58	66 persons/acre/year	17,000 acres ^d	100+	100+	100+

This table is based upon the 1979 Indiana State Outdoor Recreation Plan. Only the supply and recreational demands of residents of the region are displayed. The available recreational opportunities outside the region are not considered, nor are the recreational demands of nonresidents considered.

^aIncludes 9,800 acres of the Ohio River and 2,800 acres of inland waters.

^bIncludes 9,800 acres of the Ohio River and 600 acres of inland waters.

^cDoes not include the Ohio River or Patoka Reservoir.

^dIncludes 9,800 acres of the Ohio River and 7,200 acres of inland waters.

Boating and Waterskiing Inland lakes and the Ohio River make up the major recreational sites in the region and constitute the primary boating and waterskiing resources. The Patoka Reservoir, which is the second largest lake in Indiana, adds to the available acreage and contributed even more when its normal pool was reached in 1979. These combined resources easily supply the region's demands for boating and waterskiing opportunities. This adequate supply is expected to continue well into the next century.

Canoeing There are approximately sixty miles of canoeing streams. These consist of approximately forty-five miles of Blue River and fifteen miles of the East Fork of the White River. This abundant supply of canoeable streams is expected to supply the demand through the year 2000.

Swimming and Ice-Skating Swimming areas, both beach and pool acreage, exceed the demand. It is estimated that the surplus will continue through the year 2000, with no shortage of swimming opportunities.

A deficiency of ice-skating opportunities exists in the region. Only twenty-five percent of the current demand is estimated to be met by existing facilities. This shortage is expected to continue to the year 2000. Patoka Lake, not included in the supply and demand analysis, should substantially increase the available supply for both swimming and ice-skating.

Fishing The quality of the fisheries habitat is shown in Figure 253. Warmwater fish, including largemouth and smallmouth bass, bluegill, crappie, and other sunfish, together with rough and forage fish, are commonly found in the streams and lakes. Streams in the southeastern part of the region are generally fast.

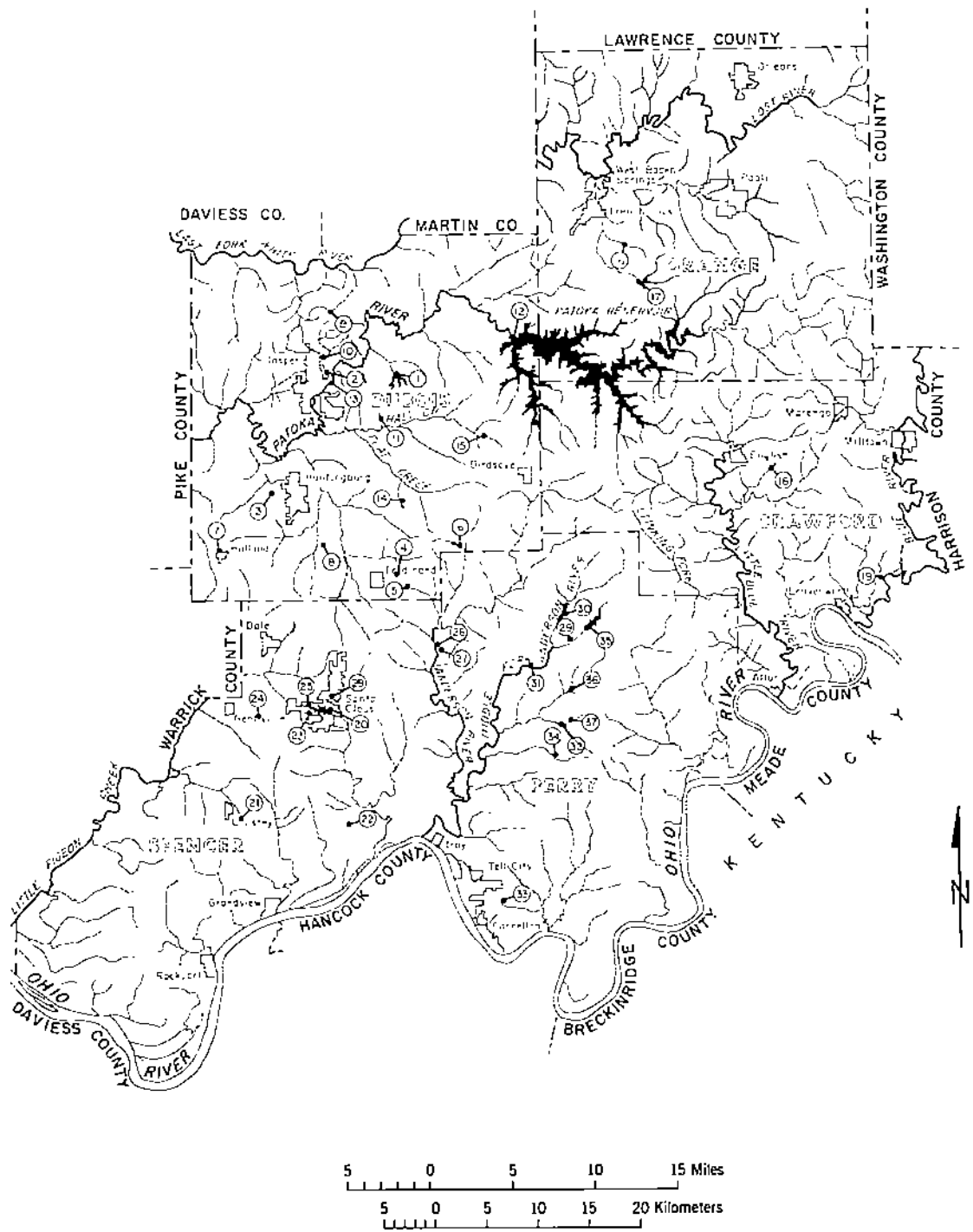
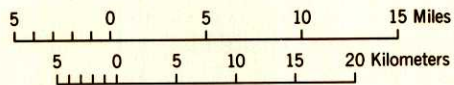


Figure 252
 Map of Region Fifteen showing the location of lakes that are at least 50.0 acres in size or with a storage capacity of 32.5 million gallons or more.



AQUATIC HABITAT VALUE





-  High
-  Moderate
-  Low
-  Negligible

Figure 253
Map of Region Fifteen showing the quality of the fisheries habitat.

flowing with sand and gravel bottoms while north-western streams are characteristically channelized with mud and silt bottoms. Sport fishing is popular along the larger streams with very good fisheries habitat such as the Little Blue River, Little Pigeon Creek, Anderson River, and Patoka River. The Ohio River is used for both sport and commercial fishing. During dry seasons, many of the smaller streams do not contain enough water to support good fish populations.

Lakes in the region are man-made and offer very good sport fishing, highlighted by Patoka Lake. Patoka Lake is stocked with walleye, largemouth bass, bluegill, redear, and channel catfish. Other lakes, including Indian, Celina, Tipsaw, Saddle, Springs Valley, and Ferdinand Forest Lakes, contain similar warmwater fisheries.

Besides fishing areas available in the Hoosier National Forest, the state provides fishing at Springs Valley Fishing Area, Harrison-Crawford and Ferdinand State Forests, Lincoln State Park, and Patoka Lake. Other public access sites are available on the Patoka and the Ohio Rivers. Bridge crossings and city-county parks may also provide access. The surplus of fishing water for the demand is expected to continue through the year 2000.

Riparian Habitat The quality of the wildlife habitat associated with streams and lakes is indicated on Figure 254. Wetlands are located mainly in the floodplain and backwaters of the Ohio River and also along Little Pigeon Creek and the Patoka River. Many types of wildlife utilize these wetlands, especially furbearers and waterfowl. Hardwood and other woody vegetation line streambanks and many lakes creating excellent

habitat for upland wildlife, some furbearers, waterfowl, and shorebirds. Smaller streams, such as some tributaries to the Patoka River, supply little valuable wildlife habitat due to loss of vegetation from channelization. Excellent habitat is found along the Ohio, Patoka, Little Blue, and Anderson Rivers, and along Little Pigeon Creek as well as Patoka Lake and most other lakes.

Hunting is permitted on Harrison-Crawford and Ferdinand State Forests. Other riparian hunting opportunities are available only on private land with permission.

Hydroelectric Power Due to the limitations of topography and streamflow characteristics, there are no current commercial hydroelectric installations in the region. However, the best opportunity for future expansion lies in additional hydroelectric development at the U.S. Army Corps of Engineers Cannelton structure on the Ohio River.

Commercial Navigation A large dam and lock system located near Cannelton in Perry County passed an estimated thirty-five million tons of cargo in 1974. Studies by the Ohio River Basin Commission indicate that the Cannelton locks and dams should be adequate to carry 105 million tons by the year 2000.

Withdrawal Uses

Public Water Supplies Crawford, Dubois, Orange, Perry, and Spencer Counties are served by thirty-seven public water utilities. Twenty-two of these are municipal systems while fifteen are rural systems. Data for public water utilities are presented in the following table.

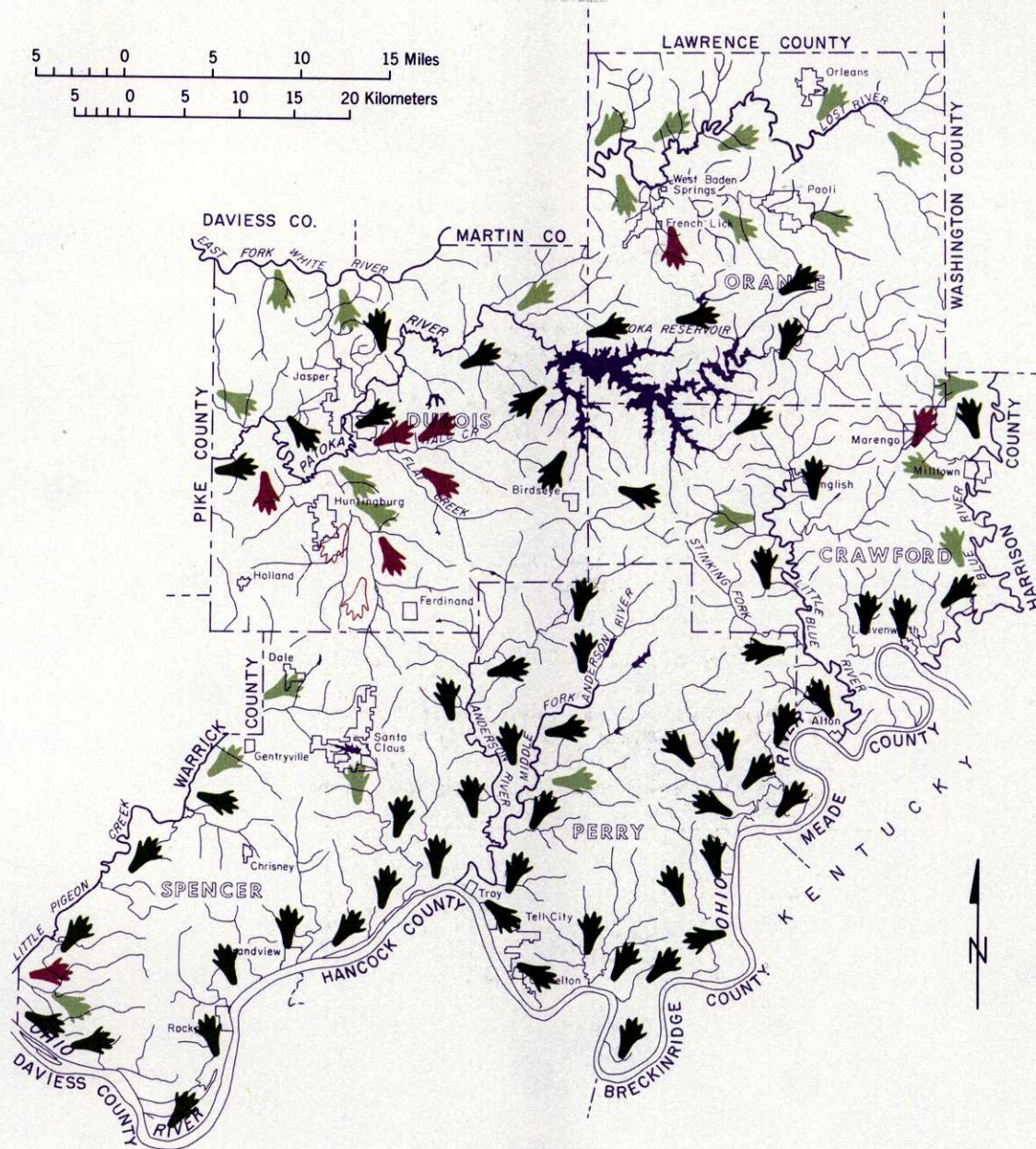
Table 207
Public water supply systems as of 1975.

<i>Counties</i>	<i>Number of Systems</i>	<i>Service Population</i>	<i>Average Daily Withdrawals in Million-Gallons-Per-Day</i>
Crawford	8	3,300	0.4
Dubois	12	22,800	2.7
Orange	4	8,000	1.1
Perry	4	12,200	1.4
Spencer	9	8,900	0.9
Total	37	55,224	6.5

The largest county-wide use of water is attributed to the twelve systems in Dubois County. These utilities served about 22,800 persons in 1975 and supplied an average of 2.7 mgd. The eight systems in Crawford County account for the smallest county-wide use of water in the region. These systems served 3,300 persons in 1975 and distributed 0.4 mgd. The service areas

and water withdrawals for public water utilities are shown in Figure 255.

Several of the utilities in the region not only supply their own water but also sell water to one or more utilities in the region. Most of the region's systems distribute water originally withdrawn from the county of use. However some systems buy and distribute water



RIPARIAN HABITAT VALUE




-  High
-  Moderate
-  Low
-  Negligible

Figure 254
Map of Region Fifteen showing the quality of the riparian habitat.