

C H A P T E R N I N E

LaMoine River Watershed

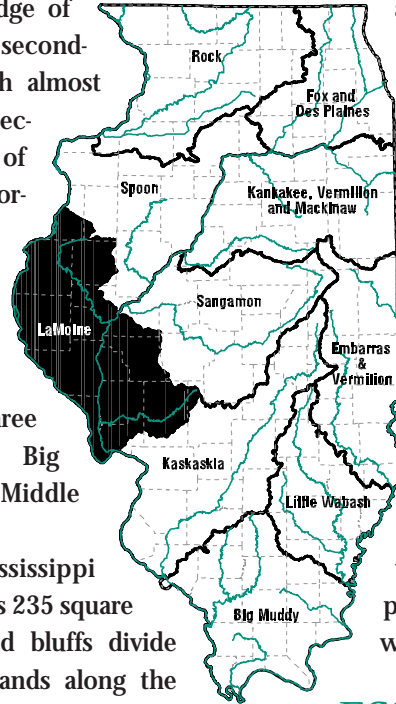


The watershed has three Resource Rich Areas — Big Rivers, Nauvoo and the Middle Illinois River.

Located on the western edge of the state, the LaMoine is the second-largest ISIS watershed with almost 4.3 million acres. It is the second-highest in the amount of surface water and upland forest, and second-to-last in the amount of urban and built-up land. (See page 108 for a color map of the watershed's land cover.)

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- Located on the Mississippi River, the Nauvoo RRA is 235 square miles. Sharply dissected bluffs divide the low, level bottomlands along the river from the higher rolling uplands. The natural resources — woodlands, wetlands and natural areas — are mainly associated with the river. The Cedar Glen Nature Preserve is a significant roosting site for wintering bald eagles.
- Big Rivers, at 979 square miles, is the largest of the Resource Rich Areas. It is characterized by



a narrow band of bluffs and rugged topography that borders the floodplains of the Mississippi and Illinois Rivers. Forest is the predominant natural vegetation, but hill prairies are common on west-facing bluffs. Sinkholes and sinkhole ponds also occur here.

- The Middle Illinois River RRA is 899 square miles — 24% in the Spoon River Watershed, 41% in the Sangamon and 35% in the LaMoine. It incorporates floodplain and upland landscapes along the Illinois River from just below Peoria to Florence. The third-largest RRA, the site includes sand prairies, plant communities which are a mix of native tallgrass and plants more commonly associated with the western U.S., such as the prickly pear cactus.

ECOSYSTEM MONITORING

Eleven sites were investigated by CTAP biologists. EPT richness, composed of taxa of moderate tolerance to organic enrichment, was slightly above the statewide average. Native fish richness was low, however. Habitat quality was a little above average,

Table 33. Watershed Land Cover

Land Cover	Acres	Percent of Watershed	Statewide Percentage*
Upland forest	720,848	16.8% (2)	17.4% (2)
Grassland	780,215	18.2% (5)	12.1% (4)
Non-forested wetland	25,767	0.6% (8)	7.3% (8)
Bottomland forest	105,135	2.5% (4)	12.0% (3)
Water	73,928	1.7% (2)	14.8% (2)
Urban/built-up	59,918	1.4% (9)	3.2% (9)
Cropland	2,521,457	58.8% (7)	11.7% (4)
Total acreage	4,287,271	100.0%	12.0% (2)

* The watershed's percentage of the land cover type statewide, e.g., 17.4% of the state's upland forests are located in this watershed. Note: the watershed's rank (1st-10th) is shown in parentheses.

despite scores being lowered by the many streams that had bottoms of highly compacted clay, providing little habitat for fish and EPT species. The best streams were Hurricane Creek near White Hall and Little Indian Creek near Virginia, small drainages that had relatively high EPT, fish richness, and habitat quality. The worst stream was the Left Fork Apple Creek near Franklin; the sampling site was near a fertilizer distributing company. Only two EPT and two native fish taxa were taken from this stream, which also scored poorly for habitat quality.

RiverWatch volunteers monitored 64 sites on 53 streams, collecting 157 samples over five years. Biological indicators suggest an average watershed. The watershed's taxa richness ranked sixth best, while taxa dominance ranked only eighth. The MBI and EPT taxa values were also near the mean. The most dominant taxa overall were midges, sowbugs, and scuds, all common organisms across the state. Although the MBI declined, the change is not statistically significant and no trends are evident.

Table 34. Watershed Indicator Scorecard

Indicator	Watershed Value	Statewide Value	Watershed Ranking
<i>Macroinvertebrates</i>			
HBI	5.4	5.2	7
MBI	5.7	5.7	6
EPT richness	8.2	7.1	4
EPT taxa (RW)	2.5	2.6	7
Taxa richness	8.8	8.9	6
Taxa dominance	82.0%	80.4%	8
<i>Fish</i>			
Native fish	10.6	13.6	10
Darter richness	1.1	1.9	9
Exotic species	0.1	0.2	4
<i>Habitat</i>			
Habitat score	97.8	88.6	3

In the fall of 1998, ForestWatch volunteers monitored three sites, all oak-hickory upland forests. During the previous spring, two sites were monitored. Tree species richness ranged from 9 to 15 species, with an average of 12 tree species per site, similar to the statewide average of 11.8

Table 35. MBI Values

Statistic	1995	1996	1997	1998	1999	Overall
Average	6.04	5.77	5.76	5.61	5.43	5.67
Standard deviation	1.03	0.77	0.86	1.36	0.68	0.97
Minimum	3.66	3.73	4.07	3.32	4.00	3.32
Maximum	8.63	7.17	8.00	9.65	6.78	9.65
Number of sites	15	21	33	31	35	135

* Only samples with at least 25 organisms were included in the analysis.

species. Twenty-one tree taxa were recorded in the watershed (75 taxa statewide). In general, the trees that were most abundant also had the highest basal areas and importance values (Table 36).

None of the sites showed signs of maple takeover and oak and hickory trees seem to be replacing themselves. Within the watershed, there were no signs of gypsy moths, but one site had evidence of dogwood anthracnose — several flowering dogwood trees were dead or dying in the sampling area as well as elsewhere in the forest.

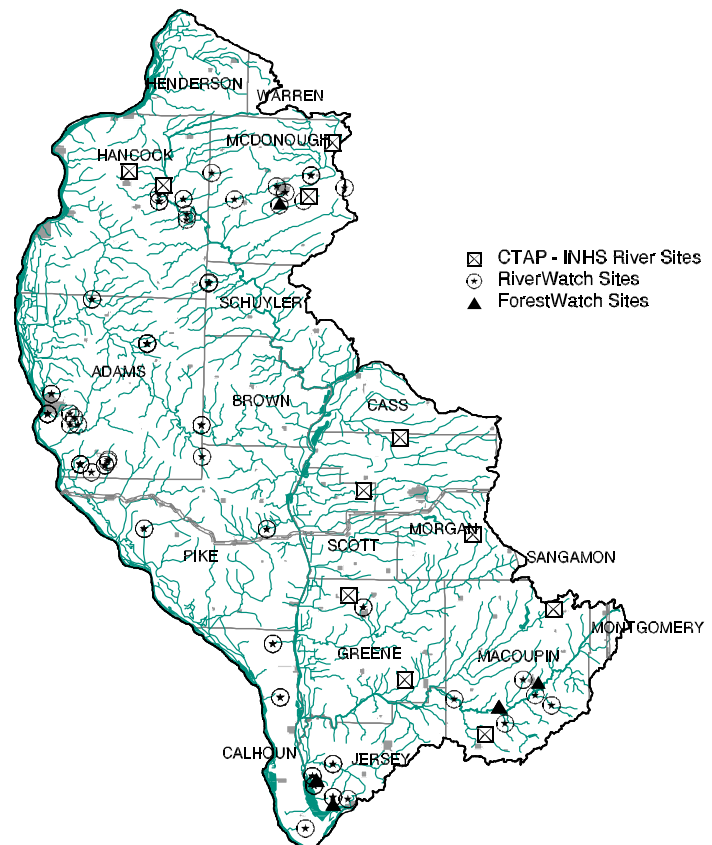


Figure 48. Monitoring sites

Table 36. Tree Species with the Highest Importance Values

Importance Value	Species	% of total trees counted (n=285)	% of total basal area (19.6m ² /ha)
52.8	Slippery elm	33%	20%
24.5	White oak	7%	18%
22.3	Flowering dogwood	12%	5%
21.3	Swamp white oak	7%	15%
17.8	Red oak	3%	16%
15.5	Hickory	12%	5%
7.8	Hackberry	5%	3%
7.8	Ash	4%	3%
6.5	Sassafras	5%	1%
6.2	Black cherry	5%	2%

Gooseberry and multiflora rose were the only invasive species recorded, but they comprised more than 75% of the shrubs and vines recorded. The density of gooseberry was much higher than the statewide average and one site had 50% of the gooseberry stems recorded statewide. During the spring survey, two disturbance-sensitive species — blue cohosh and large-flowered bellwort — were found at one site. No non-native invasive ground cover species were reported.

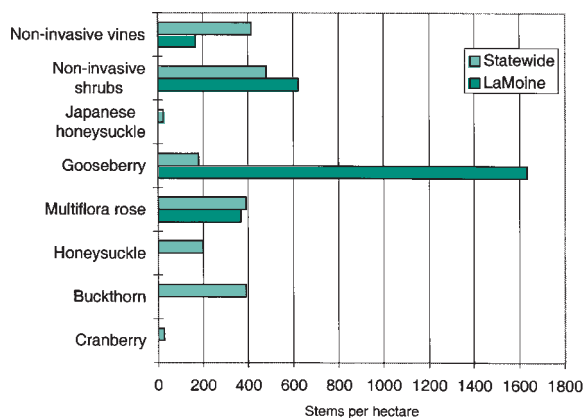
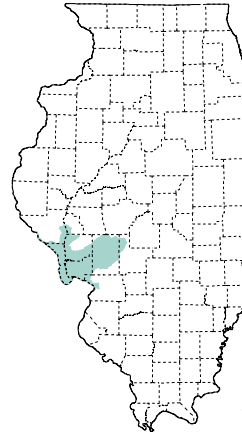


Figure 49. Number of invasive and non-invasive shrub and vine stems

REGIONAL ASSESSMENTS

One regional assessment has been conducted for this watershed — for the Big Rivers area.

Big Rivers



The Big Rivers area combines parts of five counties of west-central Illinois near where the lower Illinois River enters the Mississippi. Centered in Jersey, Madison, Greene, Calhoun, and Macoupin counties, the Big Rivers area covers some 1,770 square miles.

Much of the region is broad prairie, growing on the Central Till Plain that dominates the middle U.S. The most remarkable feature in the area is the confluence of the Mississippi and Illinois rivers near Grafton. Along the lower Illinois River, a small part of the Ozarks plateau intrudes in the form of rugged rocky hills and limestone bluffs. The region boasts several local habitats unusual elsewhere in Illinois — 16 springs, 14 caves, glades where bedrock protrudes at or near the surface of woods or prairies, and limestone cliffs whose plant communities vary according to how much sunlight each receives. Other significant features:

- one section of the Mississippi River — miles 232.5 - 241.5 in Calhoun County — has been recognized as Biologically Significant because two state endangered species, the spectacle-case mussel and the western sand darter, are found there;
- 626,795 acres have been designated a state Resource Rich Area;
- one of the few remaining small, temporary forest ponds (free of egg-eating fish) is found in the John M. Olin Nature Preserve in Madison County.

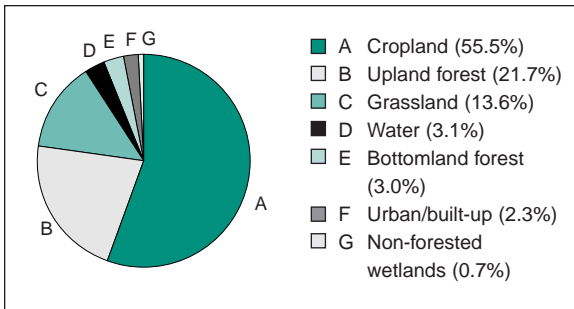


Figure 50. Big Rivers land cover

Plant and animal life

Although animal life has declined statewide since European settlement, it remains richly varied here. The region is a haven for birds, largely because of its extensive tracts of upland and floodplain forests and riverine wetlands. The bird species that live in the area (at least 90% of the species found in Illinois) are ecologically diverse and, although some are able to live in a variety of habitats, many occupy only one or a few habitats. Thirty-three of them are on the T&E list and 23 of those breed in the area.

Basin acreage - 1,133,172 acres

State land* - 10,147 acres

Federal land - 21,199 acres

Total natural areas - 5,584 acres

High-quality natural areas - 571.5 acres

Nature preserves - 509 acres

* Does not include natural areas or nature preserves that may be state owned.

Among the rare plant species found here is the decurrent false aster, a federally threatened species. Two federally-listed endangered species, the Indiana bat and the gray myotis, are also found here, as is the state-threatened river otter. The largest venomous snake in Illinois, the timber rattlesnake, also makes its home here.

Local economy and outdoor recreation

Most of the Big Rivers area is rural and has experienced minimal population growth since early settlement. Calhoun and Greene counties have actually lost population in the last 120 years. Only Madison County, which is located in the St. Louis Metropolitan Statistical Area, has grown

significantly. Its population grew five-fold between 1870 and 1970 — from less than 50,000 to about 250,000 — but has stabilized during the last two decades. More than 80% of Madison County is urban, while Calhoun County is entirely rural. In the five-county area urbanized land has grown 10% in the last ten years.

Area employment growth has been slower than that experienced statewide, and Calhoun and Greene counties both lost jobs over the past 25 years. Manufacturing has declined by one-third, although it continues to be the largest source of earnings. During the same time period, the services sector more than doubled in size and wholesale/retail trade grew by 50%. In the more rural counties, farming continues to be a major employer; in Calhoun and Greene counties 19-28% of jobs are in agriculture.

Outdoor recreation opportunities are shaped largely by the Mississippi and Illinois rivers. The river bluffs, marshes, backwater lakes, and wooded areas immediately surrounding the rivers provide the setting for several public recreation areas and for associated activities including hiking, wildlife viewing, fishing, and boating. The most frequently visited sites include Pere Marquette State Park, Beaver Dam State Park, Mississippi River State Fish and Wildlife Area, and the Mark Twain National Wildlife Refuge. The state sites contribute to the local economy, generating about \$22 million in economic output and 320 jobs.

Threats

Physical alteration - Physical change has had a profound impact on the area. For example, grazing by cattle and other livestock kills many species of forest plants, and removing trees and other bank-side vegetation over-warms streams. Building drainage ditches or straightening streams speeds the flow of water from land into streams, aggravating flooding. Virtually all of Macoupin Creek west of Carlinville has been altered in this way.

Hydrologic modification - The development of the water transportation system on the Mississippi and Illinois rivers has led to a series of dams to create pools of sufficient depth to float today's barges. The "big rivers" have been transformed into



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a series of big lakes, eliminating much of the riverine habitat such as shoals, bars, and rapids. Dams act as silt traps by slowing currents; the smothering of the riverbottom with silt has greatly reduced benthic diversity. The wakes from powerful tugboats chew away at banks and muddy the water by resuspending sediments, increasing the turbidity that hides prey from predator and cheats water plants of light. The deepening of water forced the retreat of shallow-rooted aquatic vegetation needed as shelter and food by river creatures.

Because fragmentation is not as advanced here as it is elsewhere in Illinois, the challenge is how to prevent it.



Pollution - The area is relatively untroubled by conventional pollutants. However, acid runoff from abandoned mine sites is a problem in places, mainly Macoupin County. In much of the Illinois River valley, agricultural chemicals are applied directly to the floodplain and thus are readily available to be carried into that stream. In parts of Calhoun County, farm chemicals easily enter aquifers via erosion-exposed bedrock.

Habitat loss - The local loss of presettlement habitat, while substantial, was less severe than in Illinois as a whole, except for forests. Only about 0.13% (358 acres) of local woods of any age are undegraded forest of high quality. Habitat loss often results in reduction in population sizes for many species, particularly those sensitive to habitat degradation and fragmentation. The richness of native species probably has declined in the region; in contrast, non-native taxa have increased.

Habitat fragmentation - The average size of contiguous forested wetlands in the area is 17.4 acres. The mean size of emergent wetlands, such as

marsh, is 2.4 acres. Such isolated habitat fragments often cannot supply the resources needed by species with more extensive home ranges, and the entire local populations of some plants and animal species in these tracts may consist of only a few individuals, making them more vulnerable to disease and in-breeding stress.

Because fragmentation is not as advanced here as it is elsewhere in Illinois, the challenge is how to prevent it. The large forests around the confluence of the Illinois and Mississippi are among the last sizable wooded tracts in this part of the continent. Many bird species are thought to have declined elsewhere in the Midwest, but the Big River's breeding grounds produce enough surplus birds to repopulate them.

Opportunities

Ecologically informed management has the potential to improve several impaired Big Rivers habitats.

- Smaller streams can be restored if streamside vegetation is replanted.
- The short grass of mowed roadsides near Pere Marquette State Park are perfect feeding grounds for cowbirds that parasitize song bird nests inside the park; allowing mowed grasses to grow taller at key times in the cowbird's life cycle would reduce their numbers.
- Burning the forest understory favors oak trees, which in turn favor Cerulean warblers and other spring migrant birds, and the tree and flying squirrels that eat their acorns.
- "Moist-soil" units managed for waterfowl can be drawn down in spring and fall to create excellent shorebird habitat for non-game birds.
- Small stock and farm ponds that are too small to support sport fish can provide important breeding sites for amphibians.
- Breeding populations of peregrine falcons could be re-established on the cliffs they once frequented along the Mississippi River.