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Nonpoint Source Pollution in the Illinois River Watershed

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The Arkansas portion of the Illinois River watershed is located in northwest Arkansas and includes part of communities in Benton, Crawford and Washington counties. The watershed crosses state lines into Oklahoma.

A "watershed" is an area of land where all of the water that drains from it goes to the same place, so rainwater or snowmelt in this watershed eventually drain to a common location.

The Arkansas side of this watershed encompasses 754 square miles. An estimated 172,428 people lived in the watershed as of 2010, and the rapid growth in the major urban centers from Fayetteville up to Bentonville is expected to continue. The population of Benton and Washington counties grew 44.3 percent and 28.8 percent, respectively, from 2000-2010.[1] While development often occurs in one city center, the Illinois River Watershed is unique in that it includes multiple cities that have experienced large population increases and building booms. Despite the urbanization of this watershed, 50 percent of the land remained grassland and 36 percent forestland as of 2006.[3]

Illinois River Watershed
Data source: GeoStor. Map created March 2011.

Major streams: Ballard Creek, Baron Fork, Cincinnati Creek, Clear Creek, Evansville Creek, Flint Creek, Illinois River, Moores Creek, Muddy Fork, Sager Creek, Osage Creek.

Nonpoint Source Pollution

Water pollution that comes from multiple sources spread over an area, such as runoff from parking lots, agricultural fields, residential lawns, home gardens, construction, mining and logging, is known as nonpoint source pollution. As runoff moves across the landscape, it carries natural and manmade substances that can accumulate in waterways and make them uninhabitable for aquatic species or unusable by people. Potential pollutants include bacteria, nutrients, sediment, hazardous substances and trash.[2] Given the number of potential sources and variation in their potential contributions, these pollutants are not easily traced back to their source.

This fact sheet is intended to provide a better understanding of the Illinois River Watershed and its place on the state's priority list of 10 watersheds impacted by nonpoint source pollution.

Illinois River Watershed Water Quality Issues

The primary water quality issues in this watershed represent a complex mix of municipal wastewater discharge, nutrient surpluses and rapid urbanization.[4] Agricultural practices and stream-bank erosion continue to be a water quality concern in this area, but urban development and road construction have joined the list of water quality concerns in recent years.

[1]UALR, 2011. Percent Change in Total Population. GIS Applications Laboratory, University of Arkansas at Little Rock. Available at http://argis.ualr.edu.

[2]Learn more about these categories in the Arkansas Watershed Steward Handbook, which can be found at http://www.uaex.edu/environment-nature/water/docs/ag1290.pdf.

[3]CAST, 2006. Land Use/Land Cover Data. Biological and Agricultural Engineering Department. University of Arkansas: Fayetteville, Arkansas. See http://www.uaex.edu/environment-nature/water/quality/NPSPollutionMgmt-Revised2015.pdf.

[4]Learn more about water quality at http://www.uaex.edu/publications/pdf/FSA-9528.pdf.

The region's historical use of animal manure as a fertilizer has contributed to the state designating the region including this watershed as a "nutrient surplus area." There are regulations on applying poultry litter or commercial fertilizer products to land in the area.[5]

Nitrogen and phosphorus are essential nutrients that support the growth of algae and plants. Nutrients can threaten water quality when people do not follow best management practices, such as applying the right amount of phosphorus as a fertilizer or using grassy buffers to prevent it from entering runoff water or nearby waterways. Phosphorus can also enter waterways as part of discharge from water treatment plants, which are regulated by the state and have permits that allow specific amounts of nutrients to be discharged.

There are wastewater treatment plants that discharge in this watershed. However, phosphorous levels in the Illinois River and Sager Creek have decreased significantly in recent years. In this watershed, the majority of phosphorus entering waterways comes from nonpoint sources, including runoff from farms and urban developments. The rapid increase in population growth and increase in construction in the watershed over the past two decades could contribute to the concern for nonpoint source pollution.[7]

These concerns and its border state status led to the Illinois River Watershed being designated as a priority by the Arkansas Natural Resources Commission in the state's 2011-2016 Nonpoint Source Pollution Management Plan.[8]

Arkansas' Priority Watershed List for Nonpoint Source Pollution

Arkansas has used a watershed-based approach to nonpoint source pollution management, allowing the public to guide planning to address water quality concerns. The Arkansas Natural Resources Commission, or ANRC, administers the Nonpoint Source Pollution Management Program. The program exists to reduce water pollution through the funding of watershed planning and restoration activities, adoption of voluntary best management practices and the development of technologies that assist in water pollution reduction in Arkansas. Based on public input and the use of a qualitative risk assessment matrix, ANRC has designated 10 priority watersheds as needing the greatest attention. The current risk matrix[6] identifies the following priority watersheds for 2011-2016: Bayou Bartholomew, Beaver Reservoir, Cache River, Upper Illinois River, L'Anguille River, Lake Conway-Point Remove, Lower Ouachita-Smackover, Poteau River, Strawberry River and Upper Saline.

Stakeholder Priorities

To encourage continued public input, the University of Arkansas Division of Agriculture's Public Policy Center facilitated a water quality stakeholder forum for the Illinois River Watershed in August 2015. Unlike many of Arkansas' watersheds, the Illinois River Watershed has a history of active groups working to restore waterways or prevent further pollution. A watershed management plan was created for this watershed in 2012.

Forum participants expressed continued concern that urban development was the greatest risk to water quality and could set back recent water quality improvement efforts. They referred to this risk as "urban disturbance," which is their term to describe the pollution associated with increased runoff as a result of urban growth and land use changes.

People who live, work or recreate in this watershed are encouraged to consider community priorities and watershed management plan when addressing water pollution. The public is also welcome to attend an annual stakeholder meeting where priority watersheds and nonpoint source pollution are discussed. For more information about nonpoint source pollution and its impact on the Upper Illinois River watershed, contact the Cooperative Extension Service, Arkansas Natural Resources Commission or the Arkansas Department of Environmental Quality. The Arkansas Watershed Steward Handbook is also a good source of information about basic water quality concerns and how the public can get engaged in addressing water pollution.[9]

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[5] Learn more about nutrient surplus areas at http://anrc.ark.org/divisions/conservation/nutrient-management-program/nutrition-management-planning.

[6] Learn more about the qualitative risk assessment tool at http://www.uaex.edu/publications/pdf/FSPPC116.pdf.

[7] Brion, G.; Brye, K. R.; Haggard, B. E.; West, C.; Brahana, J. V. (2011). Land-use Effects on Water Quality of a First-Order Stream in the Ozark Highlands, Mid-Southern United States. *River Res. Appl.* 27(6), 772–790.

[8] The Nonpoint Source Pollution Management Plan found at http://www.uaex.edu/environment-nature/water/quality/NPSPollutionMgmt-Revised2015.pdf.

[9] Arkansas Watershed Steward Handbook can be found at http://www.uaex.edu/environment-nature/water/docs/ag1290.pdf.

This fact sheet is one in a series of 10 fact sheets on nonpoint source pollution in priority watersheds.

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