

# *EAST OSAGE RIVER*

## *WATERSHED*

### *INVENTORY AND ASSESSMENT*



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November 30, 2001



#### **Acknowledgments**

Thank you's are in order to numerous individuals who provided assistance on this document. Thanks to Mike Bayless and Tom Groshens for information gathering and the compilation of numerous tables, and to Ron Dent for his guidance on, and editing of early drafts of this document. Mike was also a tremendous help in getting me started and making final changes to this document. Thanks to Bill Turner for the guidance he provided throughout this process. Thanks to Mark Caldwell for assistance with ArcView GIS software, his assistance in the field, and his dedication to providing the best data and information possible in GIS format. Thanks to Del Lobb for extensive help throughout the draft process. Thanks also to Missouri Department of Conservation, Missouri Department of Natural Resources, Environmental Protection Agency, U.S. Army Corps of Engineers, and U.S. Geological Survey personnel and to other contributors too numerous to mention.

#### **Executive Summary**

The East Osage River Basin is found in central Missouri in the Missouri counties of Osage, Maries, Cole, Pulaski, Miller, Camden, Morgan, Benton, and Hickory and encompasses 2,474.52 mi<sup>2</sup>. This basin has been divided into two 8-digit hydrologic units (HUCs) and fourteen 11-digit HUCs. Lake of the Ozarks was formed in 1931 in the western half of the East Osage River Basin.

#### **Geomorphology**

This basin lies within a dissected plateau known as the Salem Plateau and is represented by four of Missouri's natural divisions. Karst features are common and soils are generally acidic with moderate to low fertility. Erosion rates are generally low although new housing developments, road construction, intensive confinement of livestock and overgrazing have denuded land causing locally-increased erosion and sediment pollution.

## **Land Use**

The basin has undergone a major shift in land use during the last 300 years. Historically, the basin was occupied by the native Osage tribe. As European settlers moved into the basin, they degraded environmental quality and displaced the native people. European settlers cleared timber, overharvested fish and game, and plowed soil on steep hillsides. In the early days, people used the Osage River and its tributaries as a main mode of transportation and constructed wing dikes to control the flows of the river. In 1931, construction of Bagnell Dam was completed forming Lake of the Ozarks—a prime recreational and tourist destination. Harry S Truman Dam and Reservoir was completed in 1979. Bagnell Dam and Truman Dam both currently provide hydroelectric power generation. Agriculture in the basin has experienced a shift from a crop-based system in the earlier days of settlement to a livestock-based system today. Many concentrated animal feeding operations (CAFOs), gravel mining operations, waste water treatment plants, and urban construction projects currently exist within the basin. The Missouri Department of Natural Resources (MDNR), Environmental Protection Agency (EPA), U.S. Army Corps of Engineers (USACE), Missouri Department of Conservation (MDC), Natural Resources Conservation Service (NRCS), and county Soil and Water Conservation Districts have worked with landowners to protect natural resources in the basin.

## **Hydrology**

Precipitation in the basin is typical of a mid-Missouri basin with an average of 40 inches per year. The U.S. Geological Survey (USGS) has maintained 16 gauging stations within the basin. Due to the karst topography of the basin, a number of losing streams and springs exist within the area. Truman Dam and Bagnell Dam on the Osage River have significantly impacted the hydrology of the region.

## **Water Use and Quality**

Water of the basin is used for household use, commercial use, recreational use, and hydroelectric use. There are more than 85,000 residents of the basin served by public supplied surface water, public supplied groundwater, or private wells. Water quality is normally good, but pollution incidents occasionally occur, causing stream contamination and fish kills. The Clean Water Act requires each state to maintain a list of critically impaired streams. Currently, there are 1.9 miles of 303(d)-listed impaired streams and 50 impaired reservoir acres found within the basin. Sources of impairment include damming, riparian degradation, channel alteration, urbanization, flow alteration, sedimentation, low dissolved oxygen, point source pollution, and nonpoint source pollution. Hydroelectric power generation using the discharge of impounded water of the Osage River has caused considerable stream flow alteration and channel degradation to the Osage River below Bagnell Dam and has caused multiple fish kills below both Truman and Bagnell dams.

## **Habitat Conditions**

Habitat conditions of the basin have been considerably altered in some areas. Logging, land clearing, burning, and overgrazing have degraded fish and wildlife habitats within the basin. Stream channels have become destabilized due to peaking-style discharge from dams, gravel mining, and channelization. Riparian corridors are in fair condition throughout the basin with an average of 61% riparian forest and 35% riparian grassland. There is only about 1% of the basin in riparian cropland and <1% in urban land-use. The Osage River below Bagnell Dam has the highest percentage of riparian cropland (20%) in the basin.

## **Biotic Community**

The basin has a rich diversity of animal and plant species within its boundaries. Some species which historically

occurred within the basin could not cope with the changes brought about by the European settlers. Other species such as the Niangua darter, lake sturgeon, and pink mucket mussel still exist, although their future is imperiled due to habitat changes, overharvest, introduction of exotic species, or water quality changes. The MDC has sampled the fish communities of the basin since 1940. Each subbasin hosts a different fish community structure depending on a variety of factors including interspecific competition, habitat availability, pollution events, or hydrologic characteristics.

Bagnell Dam has significantly changed the timing of water quantity discharged down the Osage River channel. This change in discharge rates and volume may have negatively affected the fish community found in the lower Osage River and its tributaries.

## **Management Goals, Objectives and Strategies**

Six goals have been identified within the East Osage River Basin. The first of these is to protect and improve water quantity and quality in the East Osage River Basin so that all streams are capable of supporting native aquatic communities. The second is to protect and improve habitat conditions of the East Osage River Basin to meet the needs of native aquatic species while accommodating society's demands for water and agricultural production. The third is to maintain the diversity and abundance of aquatic communities and improve the quality of the sport fishery. The fourth is to increase public access within the East Osage River Basin. The fifth is to address informational and educational opportunities with the East Osage River Basin. The sixth is to manage the East Osage River Basin databases to provide accurate and up-to-date data, easy accessibility, and compatibility with other regions, divisions, and agencies. Management objectives and strategies are included under each goal.

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